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COLLEGIJ regalis MEDICORUM in LONDINO
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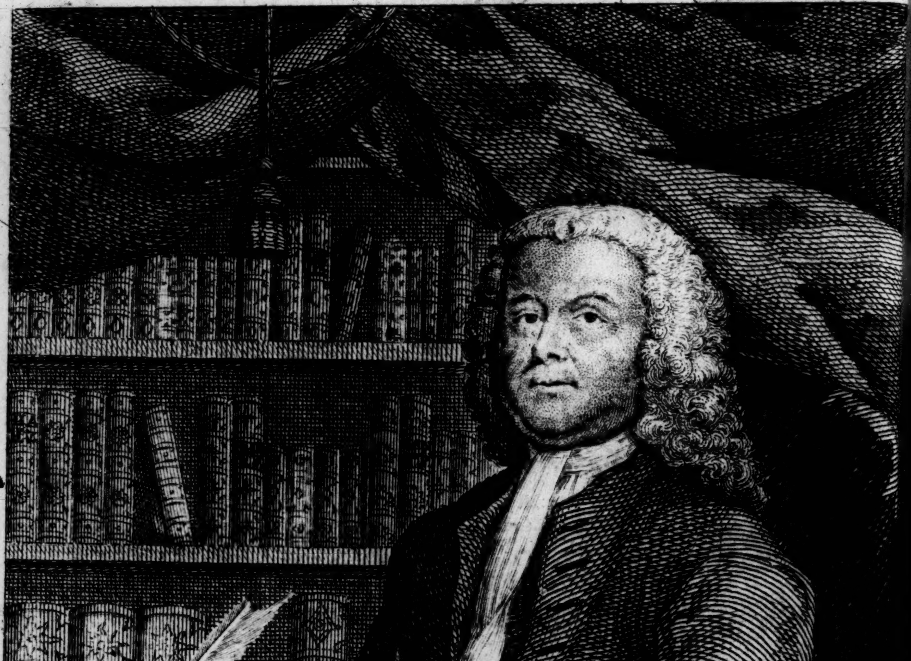
N. Brown Pinx.t J. Hulett Scul



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41/3

THE PRACTICE OF PHYSIC IN GENERAL,

AS DELIVERED IN A
COURSE OF LECTURES
ON THE
THEORY OF DISEASES,
AND THE
PROPER METHOD OF TREATING THEM.

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ADVERTISEMENT.

THE following Lectures were repeatedly read to many ſtudents in medicine, who were much pleaſed with the inſtruction they conveyed. It was therefore the Author's intention to have publiſhed them himſelf; and, with this view, he had actually prepared the greater part of them for the preſs. But (ſuch is the uncertainty of human affairs!) his life was not ſpared to accompliſh his benevolent deſign.

The Editor of theſe papers eſteems them highly, and is glad he has it in his power to offer ſo valuable a performance to the Public. They contain a theory of the cauſes of diſeaſes in general, and a proper method of treating them, as appeared in a long and extenſive practice.

Dr. LOBB's character, as a phyſician, was early eſtabliſhed by the late celebrated (or, to copy after the judicious Baron VAN SWIETEN, immortal) BOERHAAVE, by the recommendation he gave of his

Treatiſe on the Small-pox. Nor are the pieces the Doctor has publiſhed ſince that time *(a catalogue of which is added to the ſecond volume of this work)* undeſerving of equal praiſe.

Whoever deſires to be thoroughly acquainted with the life of ſo uſeful a perſon as our Author, will find a very entertaining, as well as impartial, account of it, in the *Memoirs of his Life, publiſhed by the late Rev. Mr. John Green.*

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LECTURE I.

On the Human Body.

§ 1. AS it may conduce to the better underſtanding the ſyſtem of medical practice, I ſhall, in the firſt place, give ſome account of the conſtruction, œconomy, and different conſtitutions of human bodies.

§ 2. A human living body is a ſyſtem of matter (divided into *head*, *neck*, *trunk*, and *limbs)* conſiſting of firm and fluid parts, endowed with *inceſſant* MOTIONS which are its *life*; and made capable of a great variety of *occaſional* MOTIONS, performable according to the directions of the *will* of that immortal Spirit that dwelleth in it.—It is by the determinations of the *will* that the limbs are acted, that the body walketh from place to place, and that all the labours of men, or their works, in their ſeveral employments, are done.

§ 3. The power of performing all ſorts of *voluntary* MOTIONS renders the living human body a fit habitation for the rational ſoul of a man to dwell in here for a ſeaſon.

§ 4. The human body (this ſyſtem of *living matter)* is an amazing conſtructure of numberleſs parts; parts ſo admirably contrived, connected, and adapted to their proper uſes, that the more it is examined and contemplated, the more reaſon we ſhall find to acknowledge with great *thankfulneſs*, that in it appears the manifold wiſdom, and the abundant goodneſs of God who formed it.

§ 5. It has various ſorts of veſſels, and multitudes of each kind, replete with their proper fluids; it has parts to receive aliments, and organs to *ſecrete digeſtive* or *diſſolvent* humours from the blood, for converting our food into a nutritious chyle: it has veſſels to convey that chyle into the blood; and veſſels to carry nutriment for repairing the daily waſte of the body: it hath organs for *excreting* from the body whatever may be ſuperfluous, uſeleſs, or hurtful to it:—it has organs for all thoſe *ſenſes* which may be uſeful to man:—it has many bones; ſome for defence of the noble parts incloſed within them;—as the cranium is a defence to the brains: I uſe the word in the plural number, becauſe there are two. It has the vertebræ of the neck for the ſupport of the head, and for defence of the parts adjacent: and it has the ſcapula, the vertebra of the back, and the ribs, for the ſecurity of the heart and lungs:—it has bones to ſuſtain the trunk, and to form the limbs:—it has muſcles not only as a decent cloathing to the bones, but to be inſtruments of moving them according to all incidental occaſions, or voluntary motions; and it has organs for ſecreting a fluid we call *nervous*, a fluid neceſſary to all the *vital*, the ſpontaneous, and to all *voluntary* motions: it has likewiſe organs for ſecreting the *ſemen maſculinum*, and for all other purpoſes of generation, for propagating the ſpecies.

§ 6. The general fluids ſubſiſting, and circulating in all parts of the human body, are the *blood*, or red fluid, the *lymph*, and the liquid of the nerves. And as the blood is the vital fluid, I ſhall here make ſome obſervations relative to it, *viz.*

§ 7. Obſ. 1. That the *red* BLOOD is the *central* FLUID to which all ſupplies for nouriſhment, and the maintenance of life and health are conveyed, and to which are conveyed all medicines received into the ſtomach for the cure of diſeaſes; and *from* which all the *ſecretions* and likewiſe all the *excretions* are made, except part of the *fæces alvinæ*.

§ 8. Obſ. 2. That, correſpondent hereunto, all the *viſcera*, veſſels, glands and other parts of the body do ſerve either to receive, attenuate, prepare, and convey *aliment* to the *blood*, for ſupplying what becomes wanting by means of its daily expences; or to receive and ſeparate from it thoſe fluids, which are neceſſary for maintaining the *vital*, the *natural* and the *animal* FUNCTIONS; or to receive and excrete from the blood what is hurtful, or ſuperfluous. And it is on this account, that the *blood* may be eſteemed the *central* fluid in the body; and for the like reaſons the HEART may be called the central ſolid part of it.

§ 9. The conſideration of this ſtate of things (§. 7, 8.) may convince us, that it is of the utmoſt importance that the quantity of the blood be kept up to the ſtandard of health. For *the life of the fleſh is in the blood:* it is *the life of all fleſh*; the blood of it is the life thereof, (Levit. xvii. 11, 14.)

§ 10. Obſ. 3. The *arterial* blood conſiſts of a great variety of very different ſorts of particles of matter; as it contains an abundance of red globules, and many ſaline, aqueous, oleagenous, and ſubtile or ſpirituous humours; and many heavy, rough, angular, porous, and terrene corpuſcles; and indeed all the different component globules, or particles, which conſtitute all the different animal fluids that are ſecreted from it.

§ 11. For the conſtituent parts of the ſeveral fluids ſecreted from the blood, did, before their ſecretion, exiſt in it, in the ſame form and texture which they have afterwards; the modification or figure of them not being altered by their paſſing into the ſecreting veſſels: for, if thoſe veſſels gave any form to the particles of matter impelled into them (as moulds give ſhape and figure to the melted *metals* caſt into them) that form muſt be the ſame in all particles of the ſecreted fluids, viz. *oval*, or *globular*; becauſe all the orifices and cavities of all the ſecreting veſſels are either *circular* or *oval*; oval, when compreſſed; circular, when they are not compreſſed: but there are divers ſorts of particles ſwimming in, and mixed with the animal fluids, whoſe form is not globular, and whoſe textures are very different, and whoſe figures we know not.

§ 12. Obſ. 4. There is a certain quantity of *current blood* in the body of every man, which may be called the healthful ſtandard; any conſiderable increaſe of which would be a *morbid* EXCESS, and any conſiderable diminution of which would be a *morbid* DEFICIENCY.

§ 13. By this expreſſion, viz. the *current blood*, I mean that portion or quantity of the red fluid, which may run out of the body upon opening the veins and arteries; and which, during life, is continually flowing through the heart, lungs, and larger ſanguine veſſels.

§ 14. There is much more blood contained in the body, than that which I call the *current blood*, even all that red fluid which fills all thoſe *minute* ſanguine arteries and veins, which conſtitute ſo much of the ſubſtance of the muſcles which we call fleſh: but as the motion of the blood in thoſe minute veſſels is much ſlower than in thoſe that are larger, and as the blood contained in them will not flow out of them upon emptying the larger arteries and veins, ſo an inquiry into what may be the preciſe quantity of it, is of no great importance.

§ 15. Obſ. 5. That the mean quantity of *current blood* in an animal body is not more than the *nineteenth* part of the weight of that body which contains it.

§ 16. The truth of this obſervation appears from ſome experiments made by the ingenious Dr. *Hales* on the bodies of horſes. (Hæm. vol. 1. p. 270 and p. 277.) And,

" In December 1733, I made two experiments for finding out the quantity of the current blood, or the proportion of its weight, to the weight of the body which contained it.

" 1. The firſt was on a lamb, which weighed *twenty pounds* and *eight ounces:* it was immediately killed, and the blood was all received into an earthen pan till it expired, which weighed *fourteen ounces* and *ſeven drachms:* ſo that the blood which run out was near *one* part in *twenty-two* of the weight of the body; but ſome blood run out after the lamb expired.

" 2. The other experiment was on a SHEEP, which weighed an *hundred* and *twenty pounds* and *ſix ounces*, and was immediately killed after it was weighed:—the blood which run out, weighed *four pounds*, *twelve ounces*, and *ſix drachms*; and therefore was pretty near the *twenty-fifth* part of the weight of the body."

Hence I think it appears, that if we grant that the quantity of the *current blood* in an animal body is the nineteenth or twentieth part of the weight of the body, we make a very large allowance: and ſuppoſing that there is quantity for bulk the ſame proportion of *current blood* in the body of a man, we may know the quantity of the *current blood* in any man very nearly, if we get the knowledge of the weight of his body.

§ 17. And according to this proportion a human body weighing 160lb. has *eight pints* and *nine ounces* of current blood; and a body that weighs 200lb. has *ten pints*, eleven ounces, and two drachms of current blood.

§ 18. It is of great importance to know in what proportions to the diminutions of the quantity of the *current blood*, the *vital ſtrength*, or force, may be diminiſhed.

§ 19. And the obſervations which Dr. *Hales* made on his experiments will afford us a very uſeful light, which may guide our judgment as to the caſe of human bodies.

§ 20. 1. He found that on taking away *one quart* of blood from a mare (that is, the *ſixteenth* part of that mean quantity of current blood, the loſs of which at once did kill her) diminiſhed her vital ſtrength about *one tenth* part (H. vol. 1. p. 280, &c.)

§ 21. Hence it ſeems reaſonable to infer, that the taking away *ſix ounces* and *two drachms* of blood from a man weighing 160lb. (that is, the *ſixteenth* part of one hundred ounces, which is the mean quantity of current blood in ſuch a man, the loſs of which at *once* might kill him) may diminiſh his vital ſtrength about one tenth part.

§ 22. I ſpeak of bodies in which the quantity of the blood does not exceed the ſtandard of health.

§ 23. 2. Dr. HALES obſerved upon taking away *two quarts* of blood from the mare, that the vital ſtrength was diminiſhed above one *ſixth* part, (ib. p. 282.)

§ 24. Hence I think it may appear, that taking away *twelve ounces* and *half* of blood at once from a man weighing 160 lb. may diminiſh the force of the action of his heart and arteries above one *ſixth* part, i. e. render it a ſixth part leſs than it ought to be.

§ 25. 3, According to the doctor's obſervations upon taking away *three quarts* of blood from the mare, the circulating force was abated more than *one* fourth. (Ib. p. 283.)

§ 26. It therefore ſeems a juſt concluſion, that taking away *eighteen* ounces and ſix drachms of blood from a man, weighing 160 lb. may diminiſh his vital ſtrength more than one fourth, which is a vaſt diminution, and to be avoided. Ibid.

§ 27. 4. It appears from the doctor's experiment, that on taking away *ſix quarts* of blood from the mare her vital ſtrength was diminiſhed near one half. (Ib. p. 283.)

§ 28. And hence we may infer, that taking away *thirty-ſeven ounces* and *half* of blood at once from a man weighing 160 lb. may diminiſh his vital ſtrength near one half: a diminution ſurely which ought to be dreaded.

§ 29. I might mention other particulars concerning the *diminutions* of the vital ſtrength, in proportion to other diminutions of the quantity of the *current blood*, but it is unneceſſary.

§ 30. I may add that Dr. *Hales* relates the caſe of a *lively horſe*, which died on the loſs of leſs blood than was taken from the mare before ſhe died: and from this fact it ſeems reaſonable to infer, that a *lively man* may expire on the loſs of leſs blood, than a man that is leſs lively; and therefore, that a perſon's being briſk and lively gives but little encouragement to a plentiful bleeding of him.

§ 31. It is very manifeſt from what has been obſerved, that diminiſhing the quantity of the blood in bodies not *plethorick* certainly diminiſhes the vital ſtrength, and renders it leſs than it ought to be: and that the diminution of the vital ſtrength will be in proportion to the quantity of the blood taken away.

§ 32. Having conſidered the blood as to its conſtituent parts and quantity, I ſhall mention the principal FIRM parts of the body, and the principal FLUIDS or humours ſecreted from the blood.

§ 33. I mean by the word *humours*, any liquid ſubſtances ſeparated from the blood, as it flows through the arteries.

§ 34. The *firm* parts of the body may be divided into *five* general ſorts or claſſes, viz.

§ 35. I. Thoſe which eſpecially ſerve the *circulation* of the blood; the chief of which are the *heart* and the different arteries and veins through which the current blood is always circulating.

§ 36. II. Thoſe which ſerve for receiving, digeſting, and conveying into the blood proper aliments for the nouriſhment of the body, and maintaining all the *firm* and *fluid* parts of it in their healthy *quantities* and *qualities*.

§ 37. This ſort (§ 36.) includes the *mouth*, *œſophagus*, *ſtomach*, *lacteal veſſels*, the *inteſtines*, and all thoſe *glands* and organs which ſecrete the *diſſolvent* or *digeſtive* humours, by means of which our food is brought into a *milky* ſtate, under the denomination of *chyle:* the chief of theſe are the ſalivary glands, the glands of the ſtomach, the liver, and the *pancreas*.

§ 38. III. Thoſe which ſerve for receiving and ſeparating from the blood the humours requiſite to the performance of their MOTIONS both vital and voluntary, which are proper to an human living body, and neceſſary for the continuance of life, the actions of the body, and the propagation of the ſpecies.

§ 39. The principal of theſe are the *cerebellum* and the *cerebrum*, and the organs deſtined for the ſecretion of the *ſemen maſculinum*.

§ 40. IV. Thoſe which ſerve to receive and ſeparate from the blood ſuch parts of it as are excrementitious and ſuperfluous.

§ 41. This kind (§ 40.) comprehends all the *excreting* organs, the chief of which are the kidneys, the glands, and veſſels through which the perſpirable matter and *ſweat* paſs out of the body; the excreting glands of the noſe and ears, of the armpits and groins: and, with reaſon, the inteſtines may be mentioned among the excreting organs; becauſe, by different veſſels they ſerve to receive humours from the blood for evacuation, as well as by the lacteals and abſorbent veſſels, to convey humours to the blood.

§ 42. V. The VESSELS; that is, the long, hollow, round canals or tubes, through which *fluid* ſubſtances do paſs: theſe, excluſive of the *lacteals* and *chyliferous* duct, may be diſtributed into *four* general claſſes, viz.

§ 43. 1. The SANGUINE, which carry *red* blood, and are of two ſorts, viz. arteries and veins.

§ 44. 2. The lymphatick, which carry *lymph*; and are either lymphatick arteries, or veins.

§ 45. 3. The nerves, which carry the *nervous* fluid from the *cerebellum* and the *cerebrum*; which ſome call ſpirits. Theſe three ſorts are diſtributed through all parts of the body, more or leſs.

§ 46. 4. Thoſe minute veſſels, which go out of the capillary ramifications of the ſanguine arteries to the ſecreting and excreting organs; and thoſe which ſerve to carry nutriment to the ſeveral parts of the body.

§ 47. And it deſerves conſideration, that all the *tubuli*, or minute veſſels which ſerve either for *nutrition*, or *ſecretion*, or *excretion*, have orifices in, and go off from ſanguine arteries, and receive from the blood flowing through them, their ſeveral humours; as is well known to anatomiſts.

§ 48. Having thus given a brief general account of the *firm* parts of the body, ſo far as was needful to my preſent deſign, I ſhall juſt mention the *fluid* ſubſtances contained in them; which are either general, or particular.

§ 49. I. The *general*; which are the *red blood*, the *lymph*, and the *nervous* fluid: and theſe are in all parts of the body in their proper veſſels.

§ 50. 1. The BLOOD, or the red fluid; the conſtituent parts and uſes of which having been already mentioned (§ 10.) I need not remark any further at preſent about it.

§ 51. 2. The LYMPH. This is a clear, pellucid, and mixed fluid, ſeparated from the blood by the lymphatic arteries. It conſiſts of a water impregnated with ſpirits, ſubtile ſalts, and various other corpuſcles or particles, whoſe texture and nature, by reaſon of their minuteneſs, we know not.

§ 52. This fluid (§ 51.) ſubſerves various purpoſes; for that quantity of it which is conveyed into the lacteals, and the *receptaculum chyli*, dilutes the chyle, and renders its flowing to, and mixture with, the blood more eaſy. And that portion of it which is emptied into the *ſanguine veins* dilutes the blood, and helps to preſerve it from running into hurtful coheſions; and that part of it which is propelled through lymphatic arteries to the perſpiratory vents ſerves to carry along with it many noxious and ſuperfluous particles from the blood: and that part of the lymph which runs into the excreting *tubuli* of the kidneys ſerves to carry with it thoſe *ſaline*, *oleagenous*, terrene and other particles from the blood, which give colours to the urine.

§ 53. 3. The NERVOUS FLUID. This conſiſts of the moſt ſubtile, moſt ſpirituous and moveable particles that are ſecreted from the blood, and is neceſſary to the exerciſe of all the *ſenſes*, and to the performance of all the *motions* proper to the body, whether *vital*, *ſpontaneous*, or *voluntary*.

§ 54. II. The particular humours ſecreted from the blood ſhould likewiſe be mentioned; and the principal of theſe are the *ſaliva*, the *ſuccus* or fluid from the glands of the ſtomach, the *ſuccus pancreaticus* from the ſweetbread, and the *bile*; all which ſerve to digeſt or diſſolve our food, and tranſmute it into an healthful chyle: to which might be added ſome other humours ſecreted from the blood, but it is not neceſſary to our preſent deſign.

§ 55. After this ſhort ſurvey of a living human body (§ 2 & 54) it may be of ſome advantage to conſider the MOTIONS performed in it, their *uſes*, and their *effects*.

§ 56. Motion, as relating to material ſubſtances, is, in general, the effect of ſome moving cauſe in one, or more particles of matter, by which they change the *ſpace*, or place, in which they were before, for ſome other; whether it be backwards or forwards, or this way or that way, or both alternately.

§ 57. It is moſt certain, that there are different kinds of motion in every living human body, and ſome of them are *inceſſant* or continual while life remains; and cannot be reſtrained, abated, or quickened by any meer act of the will.

§ 58. Theſe motions (§ 57.) are called *ſpontaneous*, becauſe they naturally proceed, and are not effected by any determinations of the will; and they are called *vital*, becauſe the life of the body ſubſiſts in them; for whatſoever puts a ſtop to theſe *motions* does alſo thereby put an end to *life*, and whatever preſerves them prolongs life.

§ 59. This kind of motion (§ 57.) includes the actions of the *heart*, *arteries*, and *lungs*; and all the motions produced in, or communicated to other parts of the body by means of them: and all theſe may be reckoned one general claſs.

§ 60. There is in the human body *another* ſort of motions, which, by way of diſtinction, I call *occaſional*; becauſe they are not always, or are not continually performed.

§ 61. This kind (§ 60.) comprehends all thoſe motions which are produced by the acts of the *will:* ſuch are all the motions uſed in *ſpeaking*, *walking*, *ſinging*, *dancing*, *writing*, and *other performances* in all the works and labours of men in their different employments; which, becauſe they are conſequent to the determinations of the will, are called *voluntary*.

§ 62. And this kind of occaſional motions may be ſaid to include thoſe which are performed in the exerciſe of the ſenſes of *ſeeing*, *hearing*, *ſmelling*, *taſting*, and *feeling*; becauſe they are not performed in the time of ſleep, nor without proper external objects to excite and exerciſe them.

§ 63. This ſort alſo may be ſaid to comprehend thoſe motions which happen in *laughing*, *crying*, &c.

§ 64. It appears evident to me, that the motions performed in human living bodies may be diſtributed into two general kinds, viz.

I. The INCESSANT; all which are *vital* and ſpontaneous.

II. The OCCASIONAL; moſt of which are voluntary.

§ 65. This diſtribution (§ 64.) ſeems juſt and compleat, becauſe one or the other of theſe two ſorts includes every motion that has hitherto been diſcovered in the body: and becauſe theſe two ſorts are manifeſtly different from each other, as to the *parts* of the body chiefly acted by them; and as to the uſes and purpoſes which they ſubſerve;

ſerve; and as to the main *ſprings* or means of their ſubſiſtence.

§ 66. This laſt difference will be evident, if it be conſidered that in the head there are *two* diſtinct BRAINS, viz. a *leſſer*, and a *greater:* the leſſer has its ſituation in the hinder part of the head, and is called by anatomiſts *cerebellum:* the greater fills the anterior ſpace of the *cranium*, and has the name of *cerebrum.*

§ 67. Theſe (§ 66.) are ſo very diſtinct from each other as to be divided and ſeparately incloſed by different portions of thoſe two membranes called the *dura mater* and the *pia mater*, which make a ſeparate incloſure of each of them.

§ 68. And with reſpect to theſe *two* BRAINS, there are ſome particulars which well deſerve our notice, *e. g.*

1. That the office of the *cerebellum*, or leſſer brain, is to ſecrete from the blood a *nervous* fluid or ſpirits, for maintaining, or perpetuating to the end of life, all the *vital* or ſpontaneous motions.

§ 69. 2. That from this leſſer brain go all thoſe nerves by means of which the actions of the heart, arteries and lungs, and indeed of all the *ſecreting* and *excreting* organs, are chiefly maintained.

§ 70. 3. That the office of the *cerebrum*, or greater brain, is to ſecrete from the blood a *nervous* fluid or ſpirits for the purpoſes of all the *occaſional* motions, viz. thoſe which are performed in the exerciſe of any of the ſenſes, and thoſe which happen in all voluntary actions of any part of the body.

§ 71. 4. That from the greater brain go out all thoſe nerves which chiefly ſerve the organs of ſenſe, and all the voluntary, occaſional motions.

§ 72. 5. That the nerves emitted (if I may ſo expreſs it) from the *cerebrum* in two different parcels, called *crura medullæ oblongatæ*, and which run into *one* common covering, and incloſing membrane, together with the nerves emitted from the *cerebellum*, do with them form the *medulla oblongata:* and all theſe nerves after they have entered into the cavity of the *vertebræ* of the ſpine, are called the *medulla ſpinalis*.

§ 73. 6. That although the nerves, both from the leſſer and the greater brain, do paſs together a-while through the ſame channel, yet they are diſtinct, and carried to different parts of the body for different purpoſes.

§ 74. There are three things very obſervable, viz.

1. That the *vital* motions are not under the government of a man's will.

§ 75. 2. That the wiſdom and goodneſs of God are manifeſted in his thus (§ 74.) contriving and forming the ſtructure of the human body: becauſe if it was otherwiſe, if the vital motions were under the power of the will, and could be ſtopped as eaſily by an act of the mind, as thoſe are which are called *voluntary*, there is reaſon to think many perſons in ſudden paſſions of diſcontent would put an end to their lives by an haſty and raſh act of their wills.

§ 76. 3. That the immortal ſpirit (called the ſoul of a man, whatever be the union between it and the human body) ſeems to have its reſidence in the *cerebrum*, or greater brain, in the anterior part of the head; and, as I apprehend, in that part of it called the *ſenſorium commune*, where all thoſe nerves have their riſe which are conſtructed with the organs of ſenſe, and with all parts that are ſubject to voluntary motions; becauſe thither all the *ſpecies* or images of external objects are conveyed, which impreſs the *ſenſitive* nerves: there the ſoul receives the communication of *ideas* by means of the ſenſes: there it directs all voluntary motions by the determinations of its will; and there it *thinks*, *reaſons*, *operates* and performs all thoſe internal acts, which are peculiar to an intelligent and rational being; and which are far beyond the capacity or powers of any ſyſtem of meer matter, however modified.

§ 77. It may be of ſome advantage to conſider the courſe of the *inceſſant*, or in other words of the vital and ſpontaneous motions, and the effects produced by means of them.

§ 78. There is a certain degree of force or ſtrength in theſe motions (§ 77.) which may be called the healthful ſtandard of it: and when the force is too great (as in ardent and inflammatory fevers) thoſe remedies which may abate that force are wanted: and when the vital ſtrength is too little, the medicines that may increaſe it are needful.

§ 79. I do not inquire what part of the human living body firſt received MOTION, and then communicated it to others: this being, in my apprehenſion, a matter of great difficulty to be determined with any certainty, and the knowledge of it of very little importance.

§ 80. But I conſider the HEART as the *center* of the *vital*, ſpontaneous motions, which are either paſſing *from* or *to* it; and ſhall trace thoſe motions and their effects in the following obſervations, viz.

§ 81. Obſ. 1. That the left ventricle of the heart, by its *diaſtole*, receives from the left auricle of it, in proper *ſucceſſive* quantities, the whole maſs of blood.

§ 82. Obſ. 2. That by its *ſyſtole*, it impells the ſame diſtinct and ſeparate quantities of the blood ſucceſſively into the *aorta*.

§ 83. I call them diſtinct and ſeparate quantities, becauſe the *ſyſtole* of the ventricle, and *diaſtole* of the auricle, are *ſynchronous*: or in other words, becauſe the contraction of the left ventricle and the dilatation of the left auricle (for receiving more blood from the lungs) being at the ſame time, muſt divide the blood paſſing out of that ventricle from the next ſucceeding quantity then flowing into the *auricle*, though the time of ſeparation be as ſhort as the ſpace between the pulſations of the artery.

§ 84. Obſ. 3. That each ſucceeding quantity of blood impelled into the *aorta* (by the contraction of the left ventricle) propels the preceding onwards; and by this means, the whole maſs of blood is protruded to the extremities of the capillary ſanguine arteries, and through them into the capillary ſanguine veins.

§ 85. Obſ. 4. That every quantity of blood ejected from the left ventricle of the heart diſtends or forces the *aorta* into its *diaſtole.*

§ 86. Obſ. 5. That the diſtended *aorta*, by a *contractile* motion, re-acts, and forces the ſaid quantity of blood onwards.

§ 87. Thus while the *aorta* goes into its *diaſtole*, the left ventricle ſinks into its *ſyſtole.*

§ 88. Obſ. 6. That the motions of the ſanguine arteries are regulated by the motions of the heart.

§ 89. Obſ. 7. That as there are diſtinct quantities, ſo there are real though ſhort diſtances between thoſe ſeveral quantities of blood impelled into, and ejected by the auricles and ventricles of the heart, and into and from the arteries.

§ 90. This obſervation (§ 89.) I apprehend is evident from what has already been remarked (§ 83.) and may be more manifeſt, on conſidering that if it was not ſo, neither the *auricles* nor the ventricles of the heart, nor the arteries could have their ſyſtoles: beſides, the manner in which we ſee the blood flow out of any capillary wounded *artery*, viz. by leaps in diſtinct, ſeparate quantities, demonſtrates the truth of this propoſition, § 89.

§ 91.

§ 91. Obſ. 8. That the whole maſs of blood is in diſtinct, ſucceſſive quantities propelled through the arteries into their correſpondent veins, and through them into the *vena cava:* and thence it paſſes by ſucceſſive quantities into the right auricle of the heart; thence into the right ventricle: and thence into the *arteria pulmonalis*; and from the extremities of its ramification into the capillary branches of the pulmonary vein; which in their courſe (ſome uniting with others) become fewer and larger, till in ſucceſſive, diſtinct quantities the blood is conveyed into the left auricle, and thence into the left ventricle of the heart; out of which it is again ejected for another circulation.

§ 92. This is the courſe of the circulating blood, always moved, and always moving; always acted upon by its containing veſſels; and always acting againſt the ſides of them, eſpecially in their *diaſtoles*, as the blood flows through them, and is protruded againſt them.

§ 93. Obſ. 9. That the natural, *contractile* force of the muſcular fibres (which make very much of the ſubſtance of the auricles and ventricles of the heart and of the arteries) together with conſtant influxes of humour or ſpirits from the *cerebellum* or leſſer brain, by *nerves* paſſing from it to all the vital parts, produces the ſucceſſive, diſtinct contractions, or *ſyſtoles*, of the auricles and ventricles of the heart, and of the arteries.

§ 94. I may hereupon obſerve two things, viz.

1. That the contractile force of the muſcular fibres would keep the auricles and ventricles of the heart and arteries in a fixed ſtate of contraction, was it not for the blood being continually propelled through them.

§ 95. 2. That by the contractile actions of the auricles and ventricles of the heart, and of the arteries and lungs, MOTION is communicated to the blood; and its fluidity and circulation are continued ſo long as life laſts.

§ 96. The conſideration of theſe things may eaſily convince us, that there is in an human living body a conſtant *circulation* of *motions:* and that motion is communicated from the firm to the fluid parts of the body, and again from the fluid to the firm parts of it, by mutual, alternate re-actions.

§ 97. Obſ. 10. That the reaſon or cauſe of the *difference* of the humours *ſecreted*, and of thoſe likewiſe that are *excreted*, ſeems to lie in the different ſize or minuteneſs of the ſecreting and excreting *tubuli* of the ſeveral organs and glands; and in their different diſtances from the heart.

§ 98. Having thus conſidered the heart as the center of the vital motions, from which, and towards which, the principal *vital* motions and courſe of the blood are propagated, it will be proper to obſerve the principal EFFECTS of the *inceſſant*, ſpontaneous motions of the vital parts, which may be comprized in the following particulars, viz.

§ 99. Firſt Effect: A *preſſure* by all the ſanguine arteries (every where, when they are in their *diaſtoles)* againſt all their next adjacent veſſels, whether they be ſanguine veins, or lymphatic veſſels, or veſſels of any other denomination.

§ 100. Second Effect: A ſort of *vibrating* motion in all the veſſels, next adjacent to the ſanguine arteries. For as a preſſure againſt thoſe veſſels is the conſequence of the *diaſtole* of the ſanguine arteries, ſo a ceaſing of that preſſure is the effect of their *ſyſtoles*; and while that preſſure ceaſes, the diameters of the compreſſed veſſels will be extended, as they were before the preſſure.

§ 101. Hence it appears, that one effect of the *vibrating* motion, or alternate dilatations and contractions of the ſanguine arteries, is in ſome degree a *vibrating* motion, or an alternate compreſſion and extenſion of the next adjacent veſſel; and from them, and by means of them, to the next adjacent veſſels; and ſo on, and ſo far, as there are any veſſels adjacent; that is, to the extreme ſuperficies of the body.

§ 102. Third Effect: An *attrition*, or rubbing of the conſtituent parts of the animal veſſels.

§ 103. This (§ 102.) is performed partly by the action of thoſe conſtituent parts, ſome of them againſt others in the alternate dilatation and contraction of the veſſels; and partly, by their contained fluids, as they are propelled through them.

§ 104. Hence (§ 103.) ſome parts of the veſſels will have their bulks gradually diminiſhed, and their coheſion with the others gradually weakened, till they are ſeparated and waſhed off: and then the ſeparated parts mix and circulate with the fluids, till they are carried to, and through, ſome excreting veſſels, and ſo out of the body.

§ 105. Fourth Effect: An *attrition*, or rubbing of the globules, and other parts of the blood, and of the other animal fluids, ſome againſt others: by which means many parts of the blood, and other animal fluids, are ſo comminuted and altered, as to become unfit for the uſes of the body, and are carried out of it by one or other way of the natural evacuations.

§ 106. Fifth Effect: An *aſſimilation*, or tranſmutation of many parts of the CHYLE into the nature and qualities of the blood, and other animal humours, which thereby are made fit to become conſtituents of the firm and fluid parts of the body.

§ 107. It appears, from the three laſt mentioned *effects*, that the human body is continually *wearing*, *waſting*, and *decaying*, by means of the motions performed in it; and alſo, that by means of the ſame motions, it is continually repairing; and life and health thereby maintained.

§ 108. I may here properly add, that the wiſdom and goodneſs of God are very conſpicuous in forming our bodies in ſuch a manner, that they are eaſily nouriſhed and repaired from ſuitable aliments by means of thoſe motions which impair them.

§ 109. Sixth Effect. Another effect of the *inceſſant* motions of the heart and ſanguine arteries, and of the blood protruded through them, is the performance of the ſeveral *ſecretions* and *excretions* of our bodies.

§ 110. The truth of this propoſition will be evident, if we conſider two things, viz. 1. That the *orifices* of all the *ſecreting* and *excreting* TUBULI of the ſeveral organs and glands of the body lie open to the blood flowing through the arteries.

§ 111. 2. That the force of the motion of the blood, as it paſſes over the orifices of thoſe *tubuli* (§ 110.), together with the force of the contractile motions of the arteries (which have alternate *ſyſtoles* and *diaſtoles*, correſpondent to thoſe of the heart), certainly impels into thoſe *tubuli* ſuch particles as are minute enough to enter, and paſs through them.

§ 112. Theſe motions therefore are abundantly ſufficient for carrying on of every *ſecretion* and *excretion* that is made in the body from the blood.

§ 113. Seventh Effect. Another effect of the *vital* motions of the heart and arteries, &c. is the *protruſive* motions of the *nervous* fluid.

§ 114. For the ſucceſſive impulſions (if I may be allowed ſo to expreſs it) of the nervous fluid, from the blood into the ſecreting *tubuli* both of the leſſer and greater BRAIN, muſt needs propel onwards the quantities of *nervous* fluid before ſecreted; and hereby keep this fluid moving onwards

wards in a conſtant equable motion to all parts of the body; that is, to all the *vital* parts through the nerves, which ariſe from the leſſer brain, and to all the organs of the ſenſes, and other parts of the body, through the nerves which go off from the greater brain.

§ 115. And it is by means of the continual afflux of *nervous* FLUID to all parts of the body, that the motions of the heart, arteries and lungs; and of all the ſecreting and excreting organs and glands; and likewiſe all the exerciſes of the ſenſes, and all voluntary motions, are maintained and performed.

§ 116. If it ſhould be aſked, how it comes to paſs that ſome *ſecretions* are not made in all times of life; I would anſwer, that the reaſon of it appears plainly to be this, viz. that ſome ſecreting *tubuli* are not in the firſt years of life large enough, or their cavities open enough, to receive from the blood, and admit through them, the humours to be ſecreted by them; and in great old age they become contracted, and incapable of receiving the humours.

§ 117. This ſeems to be the ſtate of the *ſpermatic* ſecreting *tubuli* in children and youth, before they come to that time of life called *puberty:* that is, till their ſpermatic veſſels are large and open enough for their proper ſecretion: and then in the decline of life, in great old age, when the ſpermatic, ſecreting *tubuli* grow more denſe, and their cavities gradually leſs, till they become impermeable, and incapable of admitting through them thoſe parts of the blood which conſtitute the *ſemen*; and then that ſecretion ceaſes.

§ 118. Thus the *periodical* evacuations in women and the ſecretion of *milk* in their breaſts, may very rationally be accounted for.

§ 119. It ſeems very certain, that when any *periodical* or *occaſional evacuation*, or *ſecretion* happens, it is effected by the ſame motions of the arteries, and of the flowing blood, which carry on the daily *ſecretions* and *excretions*; and that at ſuch times the *tubuli* (through which ſuch humours paſs from the blood) have their cavities open to receive them from the blood.

§ 120. And that whenever any ſecreting veſſels are in a ſtate capable of receiving from the blood their proper humour; and when ſuch an humour is in the blood, and ſeparable from it, then ſuch ſecretion will happen.

§ 121. This opinion (§ 120.) appears confirmed by the effect of the applications made to the breaſts of women for ſtopping the ſecretion of their milk, when they are determined not to ſuckle their children, or think it prudent to wean them.

§ 122. The giving ſuck keeps the *lactiferous* veſſels open, and the milk flowing onwards from the blood towards their nipples: but, upon their ceaſing to give ſuck, thoſe veſſels remain full, and not well capable to ſeparate more milk from the blood: and then the applications made to their breaſts do, by *conſtringing* the lactiferous veſſels, cloſe their cavities, and render them incapable of receiving milk; and thus this ſecretion ceaſes.

§ 123. The following things deſerve remembrance, viz.

1. That the health of the human body does greatly depend on the ſtate of its *vital* MOTIONS.

§ 124. 2. That there is a certain degree of ſtrength or force in the *vital* inceſſant motions; and a certain proportion of time in the diſtances of them, which may be called the ſtandard of health, and neceſſary to the continuance of it.

§ 125. 3. That the vital motions are capable of many variations from the healthful ſtandard: they may be, in a great variety of degrees, either *too ſtrong*, or *too weak*:—and as to the times of them, they may likewiſe, in a great variety of degrees, be either *too quick*, or *too ſlow*; and they may ſuffer many irregularities, or inequalities, both as to their force, or ſtrength, and times.

§ 126. 4. That all the other *vital* motions do correſpond, or bear a certain proportion with thoſe of the heart and arteries.

§ 127. 5. That, therefore, by *feeling* the PULSE, we may deduce a certain knowledge of the *general* ſtate of all the *vital* motions of the body, and may learn things relating to the health or ſickneſs of the perſons whoſe pulſe we examine, and deduce very uſeful concluſions from the ſtate of thoſe motions. Thus,

§ 128. If by feeling the pulſe, we find the motions of the heart and arteries *too ſtrong*, and *too quick*, we may rationally conclude that the others are ſo too, and that we ought not then to adviſe any thing that will render them ſtronger, and quicker. And this is a *principle* of the practice of phyſick from which we ſhould never deviate.

§ 129. If by feeling the pulſe of a patient (who is not *plethoric)* we find, that the motions of the heart and arteries are *not* too ſtrong, we may juſtly infer, that we ought to direct nothing for him which will diminiſh their ſtrength; and conſequently ſhould not order blood to be taken from him; becauſe this evacuation, in ſuch a caſe, will render the pulſe weaker, and the *vital* ſtrength leſs than it ought to be.

§ 130. The knowing the ſtate of the *vital* motions of the ſick is of the utmoſt importance to their recovery; becauſe the phyſician's buſineſs very much conſiſts in endeavours to reduce thoſe *motions* to the ſtandard of health; that is, if they are *too ſtrong*, then to render them weaker; or, if they are *too weak*, then to make them ſtronger; and if they are *too quick*, then to abate the quickneſs; and if they are *too ſlow*, then to quicken them; or, if the motions are inequal, as to time or force, then to remove the inequality.

§ 131. What has been obſerved ſhews, there is good reaſon for that univerſal cuſtom of *feeling the pulſe* of the patient before giving any advice for his cure.

The END of LECTURE I.

LECTURE II.

Of the ſtate of human bodies in the time of health, and their different conſtitutions and idioſyncraſies: likewiſe of the requiſites to health, and the cauſe of diſeaſes; with an account of the various claſſes into which they may be diſtributed, and of the general principles or rules of practice for curing them, founded on the cauſes which produce them.

§ 132. WHILE human bodies remain in their natural and proper ſtate, all the FUNCTIONS in it, viz. the *vital*, the *natural*, and the *animal*, are rightly performed with a pleaſant facility; and ſuch a performance of them may be called health.

§ 133. The *vital* FUNCTIONS are thoſe actions, or motions, in the body, the performance of which is abſolutely neceſſary to the continuance or ſubſiſtence of life.

§ 134. Theſe are the MOTIONS of the *heart* and *arteries* on the blood circulating through them, and the motion of the flowing blood againſt its containing veſſels; the motions of the LUNGS in their *ſyſtole* and *diaſtole*; and the action or ſecretion performed by the *cerebellum*, and the actions of the ſpirits or nervous fluid ſecreted by it in the courſe of its motion.

§ 135. Theſe *motions* or *actions* (§ 134.) may be ſtronger or weaker than in a ſtate of health, and yet life ſubſiſt; but if they entirely ceaſe, there is a period to life.

§ 136. Theſe actions, or the motions of the vital parts of the body, are all ſpontaneous; that is, they do not depend on any acts of the will, but proceed without them.

§ 137. The *natural* FUNCTIONS are the actions of the *cerebrum* or larger brain (in the anterior part of the head) in ſecreting a nervous fluid, conveyed to all parts of the body ſubject to voluntary motions, and having the ſenſe of feeling.

§ 138. There may alſo be reckoned among the natural functions the actions of all thoſe parts which ſubſerve the preparation of a nutritious chyle, and the conveyance of it to the blood; and likewiſe thoſe by which the daily evacuations from the body are made.

§ 139. Theſe (§ 138.) are the *ſtomach*, *liver*, *ſpleen*, *pancreas*, *inteſtines*, *kidneys*, *ureters* and *bladder*; and all the other ſecreting and excreting glands and veſſels, whoſe actions alſo are *ſpontaneous*, and not under the government of the will, except the ſphincters *veſicæ*, *et ani*.

§ 140. The *animal* FUNCTIONS are the actions of the organs of the ſenſes; as *ſeeing*, *hearing*, *ſmelling*, *taſting*, and *feeling*; and all voluntary motions of the muſcles and limbs, regulated or performed according to the determinations of the will.

§ 141. There are great differences in different bodies, both as to the fluid and firm parts of them. As to the fluids, the proportion of the red globules of the blood in ſome may be greater in reſpect to the ſerum, and in reſpect to the lymph, than in others: and ſo in other bodies there may be a greater proportion of the ſerous parts of blood, and of the lymph in regard to the blood, than in theſe.

§ 142. Thus as to the ſtate of the veſſels and muſcular fibres: the conſtituent parts of them in ſome bodies may be nearer together, and there may be leſs fluid in their *inteſtines*, than in others; and *vice verſa*.

§ 143. There are likewiſe differences in the performances of the ſeveral functions in different bodies in the degrees of vigour and vivacity; and in ſome other reſpects, reſulting from the different conſtruction and temperament of bodies.

§ 144. Theſe differences are juſtly the foundation of the opinion of different CONSTITUTIONS of human bodies, and of diſtributing them into different denominations.

§ 145. Dr. BOERHAAVE, in his *inſtitutions* (§ 889, &c.) according to the opinion of the ancients, mentions eight different conſtitutions or temperaments of human bodies, viz. 1. The *hot*. 2. The *cold*. 3. The *moiſt*. 4. The *dry*. 5. The *bilioſe*. 6. The *ſanguine*. 7. The *phlegmatic*. And 8. The *melancholic*.

§ 146. I have formerly diſtributed the conſtitutions of human bodies into five general ſorts, viz. 1. The hot and dry. 2. The cold and moiſt. 3. The ſanguine. 4. The choleric. and 5. The melancholic.

§ 147. But it has appeared to me, on further conſideration, that they may more properly be reduced to three general kinds;

§ 148. For every body, that is not of a mean temperament, either verges or inclines to the hot and dry, or to the cold and moiſt.—I have joined *hot* and *dry* together; becauſe they always ſubſiſt together; and the greater the heat, the greater is the dryneſs, or there is proportionally leſs moiſture.

§ 149. And for the like reaſon I have reckoned *cold* and *moiſt*, as the characters of the oppoſite conſtitution, becauſe they ſubſiſt together.

§ 150. I. The firſt is the *temperate conſtitution*.

This is the *mean* between the two other ſorts; and is the happieſt and moſt deſirable; as it is the moſt diſtant from that *heat* and *dryneſs* on one hand, and from that *coldneſs* and *moiſture* on the other, which render human bodies moſt liable to diſeaſes.

§ 151. And we may conclude that thoſe perſons have the *temperate* conſtitution of body, in whom we find neither the ſigns of the *hot* and *dry*, nor the ſigns of the *cold* and *moiſt*.

§ 152. Such perſons, in their diet, ſhould uſe only temperate aliments, and carefully avoid both thoſe things which may render their bodies hotter and dryer; and likewiſe thoſe things which tend to make them cooler and moiſter.

§ 153. II. The *ſanguine*, or the *hot* and *dry* conſtitution: that is, comparatively ſo called, in reſpect to bodies of a different temperament: not to ſignify that there is a degree of heat or of dryneſs inconſiſtent with a ſtate of health; but only that in perſons of this conſtitution the vital heat is ſomewhat greater, and that there is ſomewhat more of blood, or of red globules in their blood, and leſs of the lymphatic fluid in the *interſtices* of the *muſcular* fibres, and ſomewhat leſs lymph circulating through the lymphatic veſſels, than in the bodies of others.

§ 154. There is a variety of *degrees* as to *heat* and *dryneſs* in people of this conſtitution: ſome may be more hot and dry than others.

§ 155. This ſort of conſtitution (§ 153.) comprehends that which has the denomination of *choleric*, and may be known by the following ſigns, viz.

1. Red or black hair, and curling; and the body very hairy.
2. Sometimes a reddiſhneſs on the white tunicle of the eyes.
3. Cleanneſs and agility of body.
4. Firmneſs and hardneſs of fleſh.
5. A florid or lively countenance.
6. Veins rather larger than thoſe of others.

7. A pulſe, rather more large, ſtrong, and quick, than that of others. And

8. The heat of the body rather greater than in perſons of a different temperament.

§ 156. By ſome or other of theſe ſigns (§ 155.) we may know the perſons of the ſanguine conſtitution.

§ 157. People of this conſtitution (§ 153.) are moſt liable to *ardent* fevers; to a rigidity of their fibres and veſſels; and to the diſeaſes often conſequent thereupon.

§ 158. Temperate, diluting, and moiſtening *aliments* are moſt proper for this ſort of bodies; and all heating and drying things ſhould be avoided, or ſparingly uſed.

§ 159. This caution (§ 158.) ſhould be obſerved when diet or medicines are directed for ſuch patients.

§ 160. III. The third ſort of conſtitutions of human bodies is the *lymphatic*, or the *cold* and *moiſt:* that is, comparatively ſo called, in reſpect to bodies of the temperate kind; and more eſpecially in regard to thoſe which are *hot* and *dry:* not to ſignify that there is a degree of *coolneſs* or *moiſture* inconſiſtent with a ſtate of health; but only that, in perſons of this conſtitution, the vital heat is ſomewhat leſs; and that there is ſomewhat leſs of red blood, and ſomewhat more of the particles of the lymphatic fluid in the *interſtices* of the muſcular fibres, and ſomewhat more of lymph circulating through the lymphatic veſſels, than in the bodies of the two other ſorts.

§ 161. Hence it may be obſerved, 1. That thoſe who are reckoned of a *phlegmatic* conſtitution, properly belong to this claſs (§ 160.), and differ from others of it only in degree, having ſomewhat more of *coolneſs* and of *moiſture* than they: that is, they have ſomewhat leſs of red blood, and ſomewhat more of lymph, in the temperament of their bodies.

§ 162. 2. That perſons of a melancholy diſpoſition are of this kind, viz. of the cold and moiſt conſtitution, becauſe they are ſo in too great a degree; and their blood is generally of a dark colour, and their bile more ſubject to be changed into a black colour, called *bilis atra*.

§ 163. The ſigns by which we may know that perſons are of the *cold* and moiſt, which I call the lymphatic conſtitution (§ 160.), are the following, viz.

1. Their hair is commonly ſtrait, and ſofter, and leſs in quantity than that of others.
2. Their bodies are more groſs and dull.
3. Their fleſh is ſofter or leſs firm.
4. The colour of their ſkin is more pale or white.
5. The vital heat ſomewhat leſs;—And
6. The pulſe ſomewhat weaker and ſofter than in perſons of the other two conſtitutions, or temperaments of body.

§ 164. People of this conſtitution (§ 160.) require aliments ſomewhat warming and corroborating; and ſhould be cautious in the uſe of things that are cooling, and which tend to render the quantity of the lymph exceſſive.

§ 165. If then there are but three different ſorts of CONSTITUTIONS, viz.

1. The *temperate:*
2. The *ſanguine:* And
3. The *lymphatic:*

Three things may be obſerved, viz.

§ 166. 1. Every perſon who is not of the *temperate* conſtitution, is in ſome degree either of the *hot* and *dry* temperature of the body; and on that account may be eſteemed of the *ſanguine* conſtitution: or elſe he is of the *cold* and *moiſt* temperament; and for that reaſon may be reckoned of the *lymphatic* conſtitution.

Every individual, I apprehend, is included in one or other of the *three* general ſorts mentioned.

§ 167. 2. That perſons of the *temperate* conſtitution have the moſt eaſy government of their paſſions, and are the leaſt liable to diſeaſes.

§ 168. 3. Perſons of the *ſanguine* conſtitution are moſt prone to anger and violent paſſions, and moſt eaſily let them ſubſide.

§ 169. 4. And thoſe of the *lymphatic* conſtitution are generally the leaſt liable to violent paſſions, but moſt retentive of angry reſentments.

§ 170. There are other differences in the bodies of people.

There is a vaſt variety of IDIOSYNCRASIES among them:—And

Many different *peculiarities* among different individuals; which we want words properly to expreſs or deſcribe.

§ 171. One has an antipathy to an *hare*; another to a *cat*; another has an averſion to cheeſe.

§ 172. And ſo as to medicines there may be like *antipathies*.

I knew a gentlewoman to whom honey was a poiſon; and a gentleman who could never bear rhubarb.

And cream of tartar was as a poiſon to a very near relation of mine.

§ 173. And on the account of ſuch peculiarities in human bodies, people ſay, that this or the other thing does not agree with their conſtitution.

§ 174. Here it may be proper to obſerve a few things, viz.

1. That different IDIOSYNCRASIES may happen, and often do, to different bodies of the ſame general conſtitution.

2. That, if we muſt reckon a different IDIOSYNCRASY of body to be a different conſtitution, we muſt reckon almoſt as many different ſorts of conſtitutions as there are different individuals:

Becauſe every individual body has ſome peculiarity by which it differs from all others.

3. That the three different general ſorts of conſtitutions are eaſily known and diſtinguiſhed by manifeſt ſigns:

§ 175. But the IDIOSYNCRASIES of human bodies can never be known by any ſign occurring to the notice of a phyſician.

I can never know that ſuch a man has an antipathy to cheeſe, unleſs I am told it.

Nor that bread will never agree with ſuch a woman, unleſs I am informed of it.—I knew a lady who could never eat bread, but eat pye-cruſt made inſtead of it.

4. That it is nevertheleſs a matter of importance, when we are called to a patient, to endeavour to find out his IDIOSYNCRASIES, both as to food and medicines: and therefore we ſhould always inquire both as to diet and medicines, what things diſagree with him, &c.

§ 176. But whatever be the conſtitution of this or that body, the HEALTH of every individual perſon depends on the following particulars, viz.

§ 177. 1. On a certain *quantity* of the blood, and other animal fluids: an increaſe of which would be an *exceſs*, and a diminution of which would be a *deficiency* in the body.

§ 178. And either of theſe alterations from the ſtandard quantity of them in a healthy ſtate, certainly tends to produce diſeaſes of one denomination or another: and though the body may remain in ſeeming health notwithſtanding ſome exceſs or deficiency, yet a certain degree of either of them will be followed by one diſtemper or other.

§ 179. Hence may appear the importance of one principle of medical practice, viz.

Principle. That when there is neither *exceſs* nor *deficiency* in the quantity of the animal fluids, neither *evacuants* nor medical *reſtoratives* ought to be adviſed.

§ 180. 2. Health depends on a certain degree of *ſtrength*, or force, in the action of the vital organs, and in the motion of the circulating fluids:— an exceſs, or deficiency in which, tends to produce morbid ſymptoms of one kind or other: and the pulſe of every perſon ſhews what force there is in the action of the vital organs, and in the motion of the blood; and therefore the following principle is a rule for practice, viz.

§ 181. *Principle.* That when the PULSE is neither too high nor too low, nothing ſhould be adviſed either to raiſe or to ſink it.

§ 182. 3. Health depends on a certain conſiſtence and QUALITY of the animal FLUIDS; a deviation from which evidently tends to bring on ſickneſs of one ſort or other.

§ 183. Whence the reaſonableneſs of the following principle is manifeſt, viz.

Principle. That when there is no wrong or morbid quality in the animal fluids, no *alterative* medicine ſhould be adviſed, &c.

§ 184. 4. Health depends on a certain degree of *coheſion* of all the firm parts of the body; that is, of the component parts of all the muſcular fibres and animal veſſels.

§ 185. If this (§ 184.) is too ſtrong; if their component parts adhere to each other more cloſely than in the time of health, then they may be ſaid to be *rigid*; and that is a morbid ſtate of them: and if the coheſion of their parts is weaker, if their interſtices are enlarged, and more replete with aqueous particles, than in a time of perfect health, we may pronounce them *lax*; and morbid effects will follow thereupon.

§ 186. *Principle.* Hence (§ 185.) therefore we may infer, that while the *coheſion* of the muſcular fibres and veſſels remains the ſame as in health, nothing ſhould be ordered either to contract or relax them.

§ 187. It may now be obſerved, that while the quantity of the animal fluids is neither *too great* nor *too little*, while they retain their proper conſiſtence and natural qualities, while the vital ſtrength and the coheſions of the parts of the ſolids remain the ſame they ought to be; that is, while there is nothing redundant nor deficient in the body, nor wrong as to *quality*, ſo long it remains in health.

§ 188. Hence (§ 187.) it appears, that all DISEASES are produced by one or other of theſe following cauſes, ſingly, or in ſome combination, viz.

1. An *exceſs* in the quantity of one or other of the animal fluids; which ought to be diminiſhed by proper evacuations; or,

2. Some *wrong quality* of the blood, &c. which ought to be removed by ſuitable alterative medicines; or,

3. Some *deficiency*, which ſhould be ſupplied by convenient reſtoratives; or,

4. By ſome combination of the mentioned cauſes.

§ 189. This (§ 188.) ſhews that the remedies needful for the cure of all diſeaſes may be diſtributed into the following claſſes, viz.

1. Evacuants:
2. Alterants: And
3. Restoratives; or,

4. A combination of ſome of them.

§ 190. This diſtribution of the *medical inſtruments*, or of the remedies for curing diſeaſes, correſponds with the recited *morbific* cauſes (§ 188.) and may include not only *internal* medicines, ſuch as are to be taken in at the mouth, or injected as glyſters; but likewiſe thoſe for *external* applications, as *plaiſters*, *unguents*, *foments*, &c. becauſe they all are intended either to take ſomewhat from the body, or to make ſome alteration in it, or to add ſomething to it.

§ 191. A threefold knowledge is neceſſary, to direct us to that claſs of the medical inſtruments which furniſhes us with the ſuitable remedies for curing this or that diſtemper.

§ 192. Particularly, 1. A knowledge of thoſe ſigns by which we may underſtand when *evacuants* are wanted; becauſe, if there is an exceſs in the quantity of any of the animal fluids, we muſt make evacuations from the body, and diminiſh that particular fluid which is exceſſive: and the making proper evacuation requires a knowledge of thoſe ſigns, which diſcover that the quantity of the *blood* is too great; and of thoſe which ſhew when the quantity of the lymph exceeds the ſtandard of health; and likewiſe of thoſe ſigns from which we may conclude that the quantity of the *nervous* fluid is greater than it ought to be. But if there is no exceſs in the quantity of any of the animal fluids, *evacuants* are not the inſtruments to be uſed; they are needleſs and improper.

§ 193. 2. A knowledge of thoſe ſigns which manifeſt a morbid *quality* to be in the blood; and by which the different morbid qualities incident to the animal fluids may be diſtinguiſhed one from another; and from which we may infer the nature of that particular morbid quality which is predominant in this or that *ſpecies* of diſtempers; becauſe in diſeaſes produced by and depending on ſome morbid quality, *alterative* medicines of one ſort or other are the needful remedies.

§ 194. 3. A knowledge of thoſe ſigns or ſymptoms from which it appears that there is a *deficiency* in the animal fluids, particularly thoſe which ſhew that the quantity of the *blood* is too little, and thoſe which indicate that the quantity of the *lymph* is leſs than it ought to be; and likewiſe thoſe by which we may judge that the quantity of the *nervous* fluid is deficient; becauſe if there is a deficiency in either of them, thoſe remedies ſhould be adviſed which may ſupply it; which are to be choſen out of that claſs of medical inſtruments called *reſtoratives*.

N. B. Theſe *ſigns* (§ 192, 193, 194.) will be conſidered in their proper places.

§ 195. We proceed now to treat on diſeaſes in general. A diſeaſe is any or every apparent alteration in a living body from a ſtate of health; and as human bodies are liable to numberleſs ſuch alterations, ſo the diſeaſes which may happen in them, muſt likewiſe be innumerable.

§ 196. Nevertheleſs, the origins of them are reducible to the three cauſes already mentioned (§ 189); which may be ſubdivided into *nine* ſorts of morbific cauſes; from one or other of which ſingly, or from ſome two or more of them conjunctly, all diſtempers do proceed. *e. g.*

§ 197. I. A too great quantity of the blood.

II. A rigidity of the muſcular fibres and veſſels, which commonly ſubſiſts when there is an exceſs in the quantity of good blood.

III. An exceſs in the quantity of the lymph.

IV. A laxity of the muſcular fibres and animal veſſels, which is conjunct with the exceſs of the lymph.

V. An exceſs in the quantity of the nervous fluid.

§ 198. VI. Some *morbific quality* in the blood and other animal fluids, which is the caſe not only in diſtempers ariſing from too great a *ſpiſſitude* or *tenuity* of the blood, or from a *viſcidity* or *acrimony*, or other morbid qualities produced by irregularities in diet; but alſo when *contagious* particles of any ſort are tranſmitted into the blood of healthful bodies, and produce ſickneſs.

§ 199. And it may be obſerved, that each ſort of *contagious* particles produces a diſtemper of their own kind; as *variolous effluvia* produce the ſmall-pox, and the *peſtilential* the plague.

§ 200. When the contagious *effluvia* which are tranſmitted into the blood produce a diſeaſe, they *tranſmute* many parts of the animal fluids into their own nature, and introduce a *morbid* quality into them, which may be denominated according to the *ſpecies* of the infecting matter.

§ 201. Thus in perſons under the ſmall pox, the introduced morbid quality may be called *variolous*; and in thoſe that have the meaſles the *morbillory:* and when any have the plague, the morbid quality may be called *peſtilential*; and the like in other diſtempers propagated by infection.

§ 202. VII. Another cauſe of diſeaſes is a deficiency in the quantity of the blood: or,

VIII. A deficiency in the quantity of the lymph; or,

IX. A deficiency in the quantity of the *nervous* fluid: and of theſe recited cauſes (§ 199.) there may be various combinations producing *complex* diſeaſes.

§ 203. I do not mention the *exceſs* or *deficiency* in the force of the action of the vital organs, or of the motions of the blood flowing through them, among the general cauſes of diſtempers; becauſe they are effects of ſome or other of thoſe ſpecified.

§ 204. The various diſeaſes incident to human bodies may be diſtributed into different claſſes; more diſtinctly into ſuch as the following, viz.

§ 205. I. DISEASES are either, 1. *General*; that is, when the body is generally affected; as in *fevers*. Or, 2. *Particular*; when ſome one part is only or chiefly affected; as in the *cholic*, *headach*, and the like.

II. DISEASES are either, 1. *External*; as the *itch*, and all other cutaneous diſtempers; or,

2. *Internal*; as the diſeaſes of the *viſcera*.

§ 206. III. DISEASES are either 1. Of the *firm*, and ſolid parts of the body, as the *rigidity* and *laxity* of the muſcular fibres and veſſels; or,

2. Of the *fluid* parts; as when a morbid quality happens in them;—or their quantity becomes exceſſive or deficient.

§ 207. IV. DISEASES are either, 1. *Primary*, when they are not occaſioned by any preceding diſtemper; or,

2. *Symptomatical*, when produced by and depending on a prior diſeaſe.

§ 208. V. DISEASES are either, 1. *Simple*; when one diſtemper only affects the patient; or,

2. *Complicated*, when two or more diſeaſes are united, or ſubſiſt together in the ſame body.

§ 209. VI. DISEASES are either, 1. *Hereditary*; as when they are derived from one or the other parent; or,

2. *Adventitious*, when they are produced by other incidental cauſes.

§ 210. VII. DISEASES are either, 1. *Acute*; which are attended with great danger, and come to a period in a ſhort time, as *pleuriſies*, the *ſmall-pox*, &c. or,

2. *Chronical*, which continue many weeks, or months, or years; as quartan agues, the gout, &c.

§ 211. VIII. DISEASES are called *endemical*; when they are in a manner peculiar to a country, and at all times affecting many in it; as the *plica polonica* in Poland; the *ſcurvy* in Holland, Scotland, &c.

§ 212. IX. DISEASES are called *epidemical*, when they proceed from ſome *contagion*, conveyed at different times into different places and countries; infecting many in the ſame ſeaſons, as the *ſmall-pox*, *malignant fevers*, the *plague*, &c.

§ 213. X. DISEASES are called *pandemial*, when they are univerſally rife in every place, as was the *Dunkirk* fever; propagated not ſo much by an *infection* conveyed from bodies ſick under it, as produced by a particular conſtitution or *morbific* QUALITY in the temperament of the air.

§ 214. DISEASES are alſo diſtinguiſhed in reſpect to the different *ages* of the bodies afflicted with them, viz. of *infants*, *children*, *youth*, *adult perſons*, and of the *aged:* likewiſe in regard to the different ſexes of *male* and *female*.

§ 215. DISEASES alſo have different denominations on the account of their being *more rife* in one ſeaſon of the year, than in the others; and thus ſome diſeaſes are called *vernal*, becauſe they are moſt frequent in the *ſpring quarter*; others *æſtival*, becauſe they are moſt common in the *ſummer* and *hot* weather; others *autumnal*, becauſe they moſt commonly happen in *autumn*; and others *hybernal*, becauſe they are moſt rife in *winter*.

§ 216. The cauſes of diſeaſes (in § 188 and § 197 to § 202.) are facts, when they come to ſubſiſt in human bodies: and on theſe facts are founded the following general principles or rules of practice for curing diſeaſes, viz.

Iſt *Principle.* That in diſtempers which proceed from too great a quantity of the blood, blood ſhould be taken away by the *lancet*, or by *cupping*, or by *leeches*; but in ſuch caſes, care ought to be taken not to draw off ſo much blood, as will ſink the quantity of it below the ſtandard of health; becauſe ſuch a degree of evacuation from the blood veſſels will not only render the quantity leſs than it ought to be, but alſo diminiſh the *vital ſtrength*, and be a hurt to the patient, in proportion to the deficiency made in the quantity of his blood by the exceſs of the evacuation.

And it deſerves conſideration, that an over large evacuation from the blood veſſels in *plethorick* bodies, removes indeed the general cauſe of diſeaſes intended to be removed by it; but then it certainly brings another general cauſe of diſeaſes to ſubſiſt in the blood, even a deficiency in the quantity of the blood, which can never be a right practice.

IId *Principle.* That when the muſcular fibres and animal veſſels are *rigid*, beſides leſſening the quantity of the blood, *aqueous* liquors, *nitrous*, *mucilaginous*, and *oleaginous* medicines, and ſuch like things, ſhould be adviſed.

IIId *Principle.* That when the lymphatic fluid *exceeds* in quantity, evacuation ſhould be made by urine, or ſtool, or ſweat.

IVth *Principle.* That when the muſcular fibres and animal veſſels are *lax*, beſides the evacuations mentioned, thoſe medicines ſhould be directed, which may bring the component parts of thoſe ſolids to a cloſer union, and a firmer coheſion.

Vth *Principle.* That in diſeaſes which ariſe from an *exceſs* in the quantity of the *nervous* fluid, thoſe medicines ſhould be preſcribed, which may leſſen its quantity, and remove the *exceſs*.—What theſe are will be ſhewn in their proper place.

VIth *Principle.* That in diſeaſes, when the quantity of the animal fluids does not exceed the ſtandard of health, or is not greater than it ought to be, evacuations by *bleeding*, or *purging*, or otherwiſe, ought not to be made: becauſe they will then render the quantity of them leſs than it ought to be; or, in other words, intrduce a *deficiency* into the body, which is one cauſe of diſeaſes (§ 188.) and ſhould therefore be carefully avoided.

VIIth *Principle.* That in diſeaſes, which are produced *only* by ſome wrong or *bad* QUALITY of the blood and other fluids of the body, medicines by which the morbific quality may be altered and deſtroyed, ſhould *only* be adviſed, as the proper remedies.

And it is as irrational to endeavour curing ſuch diſeaſes by making *evacuations*, and diminiſhing the quantity of the animal fluids, as it would be in diſtempers which reſult merely from too great a quantity of thoſe fluids, to attempt a removal of them by *alterative* medicines, with a neglect of the proper evacuations which ought to be made.

VIIIth *Principle.* That when the quantity of the blood is *too little*, endeavours ſhould be uſed to make up its deficiency by directing thoſe *aliments* which moſt eaſily may be aſſimilated, or tranſmuted into blood.

This is an important rule of *medical practice*, becauſe the keeping ſick perſons, in ſuch a ſtate, *too low* in their diet, may occaſion their ſinking under their diſtemper.

IXth *Principle.* That when the quantity of the *lymphatic* fluid is *too little*, the deficiency ſhould be ſupplied by ſufficient quantities of ſuch watery, diluting liquors, as may moſt eaſily be mixed with the blood, and tranſmuted into lymph.

Xth *Principle.* That when the nervous fluid is too little in quantity, medicines proper to promote the increaſe of the ſecretion of that fluid, and ſuitable cordials ſhould be adviſed.

XIth *Principle.* That in diſeaſes produced by *complex* cauſes, each concurring cauſe ſhould be conſidered, and the remedies ſhould be carefully adapted for the removal of them.

END of LECTURE II.

LECTURE III.

On the ſigns of morbid qualities, and of a deficiency in the quantity of the blood, the lymph, and the nervous fluid; likewiſe on the various ways by which diſeaſes put a period to life.

§ 217. THE *ſigns* that diſcover which of the general cauſes of diſeaſes ſubſiſt in the body of the ſick perſon, and produce his diſtemper, come next under our conſideration. I ſhall take notice of them in the ſame order in which theſe cauſes have been mentioned; and therefore,

I. I ſhall firſt relate thoſe ſigns which ſhew that the quantity of the blood is too great.

§ 218. An EXCESS in the quantity of the *blood*, or other of the animal fluids, cannot be inferred from the quantities of the *ingeſta*, or things eaten and drank: becauſe if the quantity diſcharged or evacuated from the body every twenty-four hours by the ſeveral ways of excretion, be equal to the quantity of aliments every twenty-four hours taken into the body, there can be *no* exceſs in the quantity of the animal fluids.

§ 219. And this is the caſe of very many, who eat and drink abundantly; and yet are thin and lean, without any increaſe of bulk:—and likewiſe it is the caſe of many fat or bulky perſons, whoſe weight is not increaſed by their eating heartily, and drinking plentifully.

§ 220. Indeed, if there happens an obſtruction in the courſe of any of the excretions; *e. g.* ſuppoſe the quantity uſually evacuated by the *inſenſible perſpiration*, in every twenty-four hours, to be thirty-two or forty ounces; and that by catching cold, or any other incidental cauſe, the quantity is abated half a pint daily, it will then follow (if ſome other evacuation, as *vicarious*, is not augmented) that there will be an increaſe of the fluids in the body, to the quantity of half a pint daily; and an *exceſs* in the quantity of the animal fluids will thereby be brought on, and an increaſe of the weight of the body.

§ 221. But as it is often uncertain, when an abatement of ſome of the animal excretions happens; and whether, at ſuch a time, there does not likewiſe happen an *increaſe* of another evacuation; and, as we cannot certainly know, when the quantity excreted from the body is leſs than the quantity taken into it, ſo we cannot know from the quantities of the *ingeſta*, when this or that body becomes *plethoric*, or has exceſs in the quantity of its fluids.

§ 222. The moſt certain SIGNS which diſcover an exceſs in the quantity of the *blood* are the following particulars concurring, viz.

1. A *ſanguine* CONSTITUTION of the body. I mention this as one ſign, becauſe in bodies that are *phlegmatic* or *melancholic*, and of the *lymphatic* conſtitution, the blood may have a *morbid* quality, yet it does not often exceed in quantity.

§ 223. 2. A good *appetite* and *digeſtion*. I mention this as another ſign; becauſe a *ſmall* appetite and a bad digeſtion cannot eaſily produce a ſanguine *plethora*, or too great a quantity of blood.

§ 224 3. A feeding plentifully: this may be reckoned as another ſign; becauſe if a man who has a good appetite, yet lives ſparingly, and will not ſatisfy his hunger, there can be but little reaſon to think he abounds too much with blood.

§ 225. 4. A ſedentary life may be enumerated among the ſigns; becauſe a laborious, active life, produces plentiful perſpiration and other excretions,

tions, and diminiſhes the quantity of the blood; but an inactive life does not produce expences proportionable to the receivings.

§ 226. 5. A fulneſs, and turgency of the veins; becauſe an unuſual or extraordinary diſtention of them is always one effect of too great a quantity of blood.

§ 227. 6. A fulneſs, ſlowneſs, and heavineſs of the *pulſe*; becauſe ſuch a ſtate of the pulſe is a natural conſequence of a too much augmented quantity of blood.

§ 228. 7. I may add,—If the patient has neither been lately blooded, nor had any large, ſpontaneous *hæmorrhage*; becauſe theſe evacuations diminiſh the quantity of the blood ſo directly, that, if the patient was *plethoric* before they happened, we have reaſon to think he is not ſo afterwards.

§ 229. It appears from what has been obſerved, that *only* here and there a perſon, and indeed very few in compariſon with the numbers of people, have occaſion for bleeding on account of an exceſs in the quantity of their blood.

§ 230. And, truly, perſons that ſeemingly enjoy good health, feed heartily, and live ſedentarily, are the *ſort* that may be thought plethoric, and to need bleeding: theſe, indeed, ought commonly to have the quantity of their blood leſſened.

§ 231. II. Of the SIGNS from which we may conclude that the muſcular fibres and animal veſſels are *rigid:* the chief of theſe are the following, viz.

1. A *dryneſs* and *heat* in the fleſh of the patient, as if it was parched: becauſe theſe ſymptoms ſhew, that there is leſs humidity or leſs fluid in their *interſtices*, than in a time of health; and that they are proportionally rigid: which may be occaſioned, partly, by a ſpiſſitude of the blood,

from which too little lymph at ſuch times is ſecreted; and partly by an exceſs of the vital heat, producing too great a tranſpiration of the aqueous parts from their *interſtices*.

§ 232. 2. A *littleneſs* and *hardneſs* of the pulſe, known by feeling: becauſe, when the muſcular fibres and veſſels are in ſuch a ſtate, their diſtention muſt in conſequence be proportionably leſs, and the reſiſtance of the arteries to the blood proportionally greater.

§ 233. 3. An extreme dryneſs of the tongue, from a deficiency in the quantity of the lymph, at ſuch times ſecreted from the blood to its ſuperficies; and,

§ 234. 4. A quickneſs of reſpiration; becauſe, when the veſſels of the lungs are *too dry* and *rigid*, they cannot dilate, or be diſtended ſo much as in time of health, to carry on that circulation of the blood on which life depends.

§ 235. III. The SIGNS which manifeſt an exceſs in the quantity of the *lymphatic* fluid, are the following, viz.

1. A *leucophlegmatic* habit of body; when the countenance and fleſh look white, or pale and watery: becauſe ſuch an appearance can only be the effect of too much lymph in the cutaneous veſſels.

2. A ſoft and looſe fleſh, for the ſame reaſon.

3. A weakneſs of the pulſe, for the ſame reaſon.

4. A deficiency in the vital heat; the heat of the body being leſs than in time of health.

5. The openneſs of the pores of the ſkin.

6. Spontaneous ſweats, which happen without exerciſe, or the agency of medicines; eſpecially if they are *clammy* or *cold:* and,

7. An *hydropic* and *ædematous* ſtate of the body certainly prove, that the quantity of the lymphatic humours is too great.

§ 236. IV. As for the SIGNS which ſhew that the muſcular fibres and animal veſſels are *lax*, it will be ſufficient to obſerve, that the ſigns ſpecified (§ 235.) do plainly and ſufficiently diſcover a laxity of the veſſels.

§ 237. V. The SIGNS from which we may infer that the quantity of the *nervous* fluid is *too great* are the following, viz.

1. A deficiency in the *expences* of this fluid.

§ 238. We may conclude from the largeneſs of thoſe glands (called the *cerebrum* and *cerebellum)* by which this fluid is ſecreted, and from the vaſt quantities of blood continually brought to them, and from the innumerable *tubuli* which ſecrete this fluid from it, that the quantity of the nervous fluid daily ſecreted is very large; and we ſhall ſee the occaſions for it, if we conſider the inceſſant actions or motions of the *vital organs*; and likewiſe how much is wanted for the performance of voluntary motions in a life of daily exerciſe and labour.

§ 239. And it may be obſerved, that perſons employed in hard labours, or much exerciſe, commonly expend daily as much of this fluid as is daily ſecreted.

§ 240. But if perſons uſe little exerciſe, or labour, and live a life of eaſe, eſpecially if their appetites and digeſtions are good; if their daily expences of ſpirits be not equal to the daily ſupplies of them ſecreted from the blood, the quantity of this fluid muſt increaſe beyond the ſtandard of health, or become *too great*, and prove one general cauſe of diſeaſes; and therefore ought to be diminiſhed.

§ 241. 2. A watchfulneſs, or want of ſleep, in perſons ſeemingly in health, is another SIGN of exceſs in the quantity of the nervous fluid. When we riſe in a morning we are wakeful and alert, becauſe, during the time of ſleep, the nervous fluid has been plentifully ſecreted, and we have a freſh ſtock of ſpirits; but when this ſtock is pretty much ſpent, we grow ſleepy again. This is our daily experience; and may lead us reaſonably to conclude, that in perſons who have not the natural propenſity to ſleep, in the proper ſeaſons of it, but remain watchful night after night, that there is an exceſs in the quantity of the nervous fluid. This ſeems to be the caſe in the diſeaſe called *mania*, or madneſs.

§ 242. 3. A great proneneſs to anger and paſſion is another ſign; becauſe, when there is too great a quantity of nervous fluid, or an overſtock of ſpirits (if I may ſo call it) they are ſooner put into diſorderly, or too violent, motions, which heighten the paſſions of the mind.

§ 243. 4. When perſons who lead ſedentary lives, and feed heartily on animal and ſpirituous aliments, are troubled with too much *hypochondriacal* and *hyſterical ſymptoms*, it is a ſign that the quantity of the nervous fluid is too great.

§ 244. This opinion (§ 243.) is confirmed by the happy cures which many ſuch *hypochondriacal* perſons have obtained by very long journies, or ſufficient daily exerciſe, long continued, which diminiſhes the quantity of the blood and ſpirits.

§ 245. And we may likewiſe be convinced hereof by obſerving, that hard working men and women are very rarely troubled with theſe diſtempers.

§ 246. It appears from what has been obſerved, that diſeaſes produced by any of the firſt *five* general cauſes of ſickneſs, require *evacuation* of one ſort or other, to be made for the cure of them.

§ 247. EVACUANTS therefore are the *medical inſtruments* to be uſed in treating perſons under ſuch diſtempers; and which of theſe inſtruments is the proper remedy in this or that particular caſe will be ſhewn hereafter.

§ 248. It may, at firſt view, ſeem that the *ſecond* general cauſe of diſeaſes, viz. a rigidity of the muſcular fibres and animal veſſels, does not need evacuation, but rather the addition of *diluents.* But this apprehenſion will be laid aſide, when it is conſidered, that ſuch a ſtate of the fibres and veſſels is the conſequence of an *exceſs* in the quantity of the blood, and in the vital heat; which is an argument, that in ſuch caſes the quantity of the blood ſhould be diminiſhed by *phlebotomy* or *bleeding.*

§ 249. And although the rigid fibres and veſſels do need the admiſſion of aqueous particles into their *interſtices*, yet this does not render it unneceſſary to take away blood, when the quantity of it is *too great*, but is rather an argument for it; becauſe in ſuch a caſe the bleeding contributes not only to the removing the cauſe of their rigidity, but alſo to make room for proper diluents of the blood, and a more copious ſecretion of lymph.

§ 250. VI. The next ſubject to be treated on is that of wrong or *morbid qualities* ſubſiſting in the blood of people under diſtempers.

§ 251. Here I would premiſe that fluid ſubſtances are liable to have their natural qualities altered by various incidental cauſes, without any, or with very little, increaſe or decreaſe of their quantity.

§ 252. This appears evident to me, when I conſider, that a veſſel of ale or beer is ſometimes turned ſour by claps of thunder; and that wine in a caſk becomes what we call *prick'd*, without adding any liquor to it, or drawing any of it out of the veſſel.

§ 253. And when I obſerve the *alterations* in bottled liquors without increaſing or diminiſhing their quantity.

§ 254. And as to the *animal fluids*, it is evident to a demonſtration, that they are liable to a variety of alterations in their *qualities:* we ſee great differences in the blood taken from different perſons, which is a proof that can never, with reaſon, be contradicted.

§ 255. And that wrong qualities of the blood in a certain degree will produce diſeaſes, may well be concluded from all thoſe diſtempers which are or may be cured *purely* by *alterative* medicines, without diminiſhing or increaſing the quantity of the animal fluids.

§ 256. I can truly affirm, from my own long experience and obſervations, that where there is no exceſs in the quantity of the animal fluids, *fevers* and moſt *chronical* diſeaſes, and all the *cutaneous*, may be cured by *alterative medicines*, without diminiſhing the quantity of the animal fluids, by bleeding or purging.

§ 257. I may add, that neither any exceſs nor deficiency in the quantity of the animal fluids can produce *all* the various ſymptoms of diſeaſes which occur to our notice. I have ſaid thus much on the point, becauſe I have heard it affirmed, that all diſeaſes are produced either by ſome exceſs or deficiency: if this notion was true, if it was grounded on facts, it would follow, that *evacuants* and *reſtorative* medicines were the *only* remedies wanted in the practice of phyſick.

§ 258. But conſtant, daily experience, proves that other ſorts of remedies are abſolutely neceſſary to the cure of many diſtempers.

§ 259. To ſupport the opinion, that the cauſes of diſeaſes may be reduced either to ſome *exceſs* or *deficiency*, it appears needful to ſhew, that the blood and other fluids of the body are not capable of admitting wrong qualities; or elſe, that wrong qualities in them are not capable of producing morbid effects or diſeaſes.

§ 260. VIIth. It is of great importance to be acquainted with thoſe signs, by which it may be known that a *morbid quality* ſubſiſts in the blood; and the nature of that morbid quality which produced the diſtemper that afflicts this or the other patient.

§ 261. I may obſerve in the general, that when we have no reaſon to think there was either an *exceſs* or *deficiency* in any of the animal fluids antecedent to the diſeaſe, *we ought* in ſuch a caſe to conclude, that it proceeded from and depends upon ſome wrong or *morbid quality* of the blood.

§ 262. Morbid qualities of the blood are of various kinds, and may be diſtributed into two claſſes, viz.

1. Thoſe which produce *acute* diſeaſes.
2. Thoſe which bring on *chronical* diſtempers.

§ 263. I. I ſhall conſider the *morbid* qualities which produce *acute* diſeaſes, viz.

1. A spissitude, or too great a *thickneſs* in the conſiſtence of the blood, without any *viſcid* quality.

§ 264. This morbid quality has appeared very evident to the eye, in the blood taken from ſome perſons, which has looked very florid, and with very little *ſerum* ſeparated from the *coagulum* of red globules, though it has ſtood a ſufficient time for the ſeparation of it: and thus it commonly is in *ardent* or *burning* fevers, and in the beginning of many *eruptive* fevers, from particles formed too bulky for an eaſy circulation.

§ 265. The signs of this *morbid* quality are theſe, viz.

1. *Intenſe heat*, from the friction of the red globules, too numerous in this caſe, &c.

2. *Dryneſs of the ſkin*, from a deficiency in the quantity of the *lymph* ſecreted from the blood, &c. when *too thick*.

3. The pulſe quick and ſtrong, but not hard.

§ 266. 2. A VISCID QUALITY; this is the caſe in almoſt all intermitting and remitting, and in all inflammatory, continual fevers; in pleuritic and in rheumatic fevers; as it hath been abundantly proved by the appearance of the blood that has been taken from ſuch patients.

§ 267. The *ſizy* appearance of the blood taken from perſons under theſe diſeaſes may be called ocular demonſtration.

§ 268. The SIGNS by which we may know that there is a *viſcid quality* in the blood of perſons under ſuch fevers; and that they depend upon it, are ſome or other of the following ſymptoms, viz.

§ 269. 1. A pulſe *quicker* than in health; becauſe it ſhews, that ſome of the capillary arteries are obſtructed; that is, that the blood does not paſs through them ſo eaſily as in the time of health; conſequently that the blood, or ſome parts of it, are become viſcid: or, that there are particles too bulky to paſs eaſily through ſome of the ſmall canals; which occaſions the motion of the blood to be quicker in the other arteries.

§ 270. 2. A pulſe *harder* than in time of health, as in *pleuriſies:* becauſe upon bleeding patients, who have this ſort of pulſe, their blood appears to be *ſizy* or *viſcid*.

§ 271. 3. A pulſe *unequal* as to *time*, which ſeems to ſignify an *unequal viſcidity* in the blood, which therefore runs *faſter* through the capillary arteries, while the thinner parts of it are flowing; and *ſlower*, while the more *viſcid* parts are paſſing through them.

§ 272. 4. A *painful* reſpiration, as in pleuriſies: becauſe a *permanent*, *violent* PAIN in acute fevers, is the effect of an *inflammation* or *obſtruction* in the part pained: and as the inflammation of any internal part of the body is the effect of a *viſcid* quality in the blood, ſo we may conclude, when we meet with this ſymptom, that the blood is *viſcid*.

§ 273. 5. An *unequal* reſpiration is another ſign; becauſe it ſhews an obſtructed circulation of the blood, reſulting from an unequal viſcidity of it.

§ 274. 6. A tongue that looks *white* and *furry:* becauſe a *viſcid* quality, ſubſiſting in the blood will prevent ſufficient ſupplies being carried to the extremities of the capillary veſſels on the ſuperficies of it; which therefore become empty of red blood, and look *white*, becauſe they only contain ſome *lymph*.

§ 275. It may be obſerved, that there are in different bodies, and in the ſame bodies at different times, *different* SORTS of *viſcid* qualities.

§ 276. For as different ſorts of viſcid fluid ſubſtances may be compounded from different ſorts of *meal*, *gums*, &c. mixed with water, ſo we have reaſon to think, that in different fevers, produced by and depending on a *viſcid* quality in the blood, the *viſcid* qualities in ſeveral of them are ſpecifically different from one another.

§ 277. This likewiſe we may infer from the different effects of the morbific cauſe in the different ſorts of fevers reſulting from a *viſcidity* of the blood.

§ 278. 3. An ALCALINE, DISSOLVENT QUALITY (or *acrimonious* particles of a diſſolvent nature) mixed with the blood, more or leſs deſtroying its conſiſtence, and rendering it *too thin*, is another cauſe of fevers, and of thoſe colliquative looſeneſſes and ſweats which have no fever attending them.

§ 279. We may know that ſuch a quality ſubſiſts in the blood, and produced the fever, or other acute diſtempers, by the following SIGNS, viz.

1. A pulſe, in fevers, which is weak from the beginning, and through the progreſs of them: that is, *weaker* than in time of health: becauſe it ſhews an inſufficiency of the influxes of nervous fluid from the *cerebellum* to the heart and arteries, for keeping up the force of the action of the vital organs to the healthful ſtandard; and that the deficiency in the quantity of the fluid ſecreted by the *cerebellum* from the beginning, diſcovers *diſſolvent* particles ſubſiſting in the blood, which deſtroyed many of the component parts of it, and the texture of many of thoſe particles which conſtitute the nervous liquid.

§ 280. 2. A pulſe, in fevers, like that in a ſtate of health is another ſign; becauſe it ſhews there are no obſtructions in the capillary arteries: conſequently, that there are no *viſcid* humours, nor particles in the blood, too bulky for an eaſy circulation: but then it ſhews that ſuch fevers were produced by *diſſolvent* cauſes, or by ſuch particles as occaſioned a *diſunion* between the component parts of the animal fluids, and rendered them *too thin.*

§ 281. 3. An *eaſy* reſpiration in fevers, attended with a *dry* and *black* tongue, is another ſign of a *diſſolvent* quality in the blood: becauſe it ſhews, that there is no conſiderable *viſcidity* in it, nor particles too bulky to paſs eaſily through the capillary arteries; but, on the other hand, it diſcovers that there are *acrimonious* or *corroſive* particles deſtroying the conſiſtence of the animal fluids, and rendering them thinner than they ought to be: and likewiſe *corroding* and *deſtroying* the emiſſary ducts ſituated in the *ſuperficies* of the tongue.

§ 282. 4. The tongue in fevers appearing *moiſt*, and with *aphthæ*, (i. e. ſmall white ulcers) is another ſign; becauſe it ſhews that the blood abounds with *acrimonious* and diſſolvent particles: it ſhews, that there is a ſufficient quantity of *lymph*, and none or very little viſcidity in the blood; and alſo ſhews that it abounds with *acrid* particles of a *corroſive* nature, which by *corroding* or eating away parts of the ſuperficial membrane of the tongue, and the extremities of many emiſſary ducts terminating on the ſuperficies of it, do produce the little ulcers which appear to us.

§ 283. 5. Pains, in fevers called *biting*, or *gnawing*, are another ſign, becauſe they are produced by particles in the blood, &c. of a *pungent*, *corroding* texture.

§ 284. 6. Itchings on the fleſh in fevers, likewiſe the pains called pricking or ſtinging, muſt be reckoned among the ſigns mentioned, becauſe they are produced by acrid pungent particles excreted from the blood, and ſtriking againſt the extremities of the nerves affected.

§ 285. 7. That urine in fevers, which is much in quantity, *fat*, and *oily*, and which may be called *colliquative*, is another ſign of a *diſſolvent quality* ſubſiſting in the blood; becauſe it proceeds from particles mixed with it, deſtroying the texture or conſiſtence of the animal fluids.

§ 286. 8. That urine in fevers, which is *bloody*, diſcovers a *diſſolvent quality* in the blood, comminuting the red globules, or dividing them into leſſer, and *relaxing* the *excreting tubuli* of the kidneys; becauſe otherwiſe blood could not paſs from the kidneys with the urine.

§ 287. 9. That urine in fevers, which emits a *cadaverous* ſcent, is another ſign of the ſame import; becauſe it is the effect of a great diſſolution of the component parts of the blood, and of a *putrefaction* of the fluids or ſolids of the body, ſimilar to that which always follows death.

§ 288. 10. Those stools in fevers which are *thin* and *bloody*; 11. And thoſe which are colliquative without blood; and 12. Thoſe which are putrid, and have a cadaverous ſcent, are ſymptoms that very plainly diſcover a diſſolvent quality ſubſiſting in the blood.

§ 289. 13. Sweats *colliquative*, that is, ſweats which are profuſe, feel greaſy and clammy, and are attended with a waſting of the fleſh, and a feeble pulſe, and loſs of ſpirits and ſtrength, are another certain ſign ſhewing a *diſſolvent quality* to be predominant in the blood.

§ 290. When therefore a perſon, ſick of a fever, has ſome of the ſymptoms mentioned (§ 278 to § 289.) we ought to conclude, that it was produced by a *diſſolvent* quality ſubſiſting in the blood; and may well be convinced, that *no evacuants* but thoſe medicines which may be effectual to free the blood from ſuch a quality, are the proper remedies: we may be ſure, that making evacuations by *bleeding* or *purging* is not like to ſave the life of the ſick, but to haſten his death.

§ 291. 4. Specifick *morbid* qualities are to be conſidered among the cauſes of *acute* diſeaſes.

§ 292. I call that a *ſpecific morbid* quality, which is produced in the animal fluids by *effluvia* emitted from a perſon ſick, under one or other *ſpecies* of contagious diſtempers; the infecting *effluvia* producing in the blood a morbid quality of their own *ſpecific* nature.

§ 293. Thus the infection of the *ſmall pox* (in bodies where it produces that diſtemper) introduces a morbid quality into the blood, which may be called a *variolous* quality; and which is the productive cauſe of thoſe ſymptoms that diſcover to us the diſtemper reſulting from it to be that *ſpecies* which we call the ſmall pox; and the *variolous* quality may be called a *ſpecific* quality.

§ 294. And thus the contagion of the *plague* produces that *morbid* quality in the animal fluids, which may properly be called *peſtilential*; and upon diſcovering thoſe ſymptoms in any perſon, which are the natural and peculiar effects of ſuch contagion, it is that the phyſician declares the diſtemper to be the plague; and the *peſtilential* quality may properly be called a *ſpecific*, *morbid* quality.

§ 295. The like may be ſaid concerning the morbid quality produced by *effluvia* emitted from bodies under any other infectious fever:

§ 296. The contagious *effluvia* producing a diſtemper of the ſame *ſpecies* with that of the body from which they were emitted.

§ 297. In contagious diſtempers, the infecting *effluvia* received into the blood, by *attracting* or by being *attracted* by many particles of it, do aſſimilate and tranſmute many parts of the animal fluids into their own nature; and diffuſe through the blood a quality of the ſame ſpecies and denomination with the diſeaſe from which they proceeded.

§ 298. And this or that *ſpecific* morbid quality may be known to ſubſiſt in the blood of the patient, by obſerving what are the *diagnoſtic* ſymptoms of the diſeaſe wherewith he is afflicted, &c.

§ 299. 5. COMPLEX *morbid qualities* muſt come under our conſideration; becauſe, in many *acute* diſeaſes, different morbid qualities *coexiſt*, and concur to the production of the ſymptoms.

§ 300. Thus often in the confluent, and in he higheſt degrees of the diſtinct, *ſmall pox* there s, at the ſame time, a *viſcidity* and a *diſſolvent* acrimony ſubſiſting in the blood; and the like happens in many *putrid*, and *malignant*, and in *peſtilential* fevers.

§ 301. It may ſeem difficult, at firſt view, to conceive how ſuch different qualities can ſubſiſt in any fluid matter at the ſame time: but the difficulty will vaniſh, if we conſider, that in what is called the MOTHER in vinegar, there is both a very viſcid, and a very acid, acrimonious quality.

§ 302. And the following ſymptoms, in any perſon under a fever, are ſigns, ſhewing that the diſeaſe was produced partly by *inſpiſſating* and partly by *diſſolvent* cauſes. Particularly,

§ 303. 1. A PULSE that is *quick* and *weak* from the beginning, and onwards in the progreſs of the fever: becauſe the quickneſs of it ſhews that there are obſtructions in many of the capillary arteries, and conſequently *viſcid* humours which occaſioned them: and the *weakneſs* of it ſignifies a *deficiency* in the quantity of the *nervous* fluid ſecreted by the *cerebellum*; and, conſequently, a *diſſolvent* quality (or diſſolvent particles) in the blood, which in a great meaſure deſtroyed the texture of thoſe parts of it which ſhould conſtitute the fluid of the nerves.

§ 304. 2. A *pulſe* UNEQUAL as to *time* and *force*: becauſe the *inequality* of the times of the pulſations of the artery ſhew a *viſcidity* in the blood, unequal in its conſiſtence; the blood flowing *quicker* thro' the arteries, while the thinner parts are carried through them; and *ſlower*, when the more viſcid humours are protruded through them: and becauſe the *inequality* in the *force* of the pulſe ſhews a *deficiency* in the quantity of the blood, and in the quantity of the nervous fluid ſecreted by the *cerebellum*; conſequently, that diſſolvent particles mixed with the blood, and deſtroying many of its component parts, have leſſened its quantity, and thereby diminiſhed the quantity of the humours or fluids ſecreted from it.

§ 305. 3. The TONGUE in fevers, which is *black*, *dry*, and *chapt:* becauſe it ſhews that the diſeaſe was produced by *complex* cauſes, as it diſcovers to us a *viſcid* quality in the animal fluids, which hinders their flowing to the *ends* of the capillary veſſels in the ſuperficies of the tongue: and hence likewiſe it is, that the fleſh of perſons under ſuch fevers feels dry: and it ſhews likewiſe, that *diſſolvent* particles ſubſiſt in the blood, deſtroying the coheſion of the component parts of the veſſels where *they* become ſtagnant; which is the caſe when this SYMPTOM happens. For,

§ 306. In thoſe extreme parts of the veſſels of the tongue, which appear *black*, there has been a STAGNATION of their contained fluids, ſo far as they appear black; and a *mortification* of thoſe veſſels in conſequence of it, ſo far as they appear black.

§ 307. 4. The tongue, which in fevers has the *aphthæ*, (§ 282.) ſhews an acrimonious quality ſubſiſting in the animal fluids, (vid. § 282.) and if there is but little moiſture with the *aphthæ*, it ſhews alſo, that there is a *viſcidity* as well as an *acrimony* in the blood.

§ 308. 5. PAINS in fevers that are *acute*, *lancing*, *cutting*, or *grinding*, are another ſign of the ſame import; becauſe they diſcover that the capillary veſſels of the *perioſteum* are exceedingly diſtended, and the extremities of the adjacent nerves moſt violently compreſſed, and acrid particles brought into immediate contact wrth the nerves; which ſhews both a *viſcid* and *acrimonious* quality ſubſiſting in the blood; and, conſequently, that the diſeaſe was produced by different cauſes in combination, or, in other words, by *complex*, morbid qualities: and I have divers times obſerved in patients under the ſmall pox this ſymptom ſoon followed either with the deep petechiæ, i. e. purple ſpots, or ſome hæmorrhage.

§ 309. Whenever we find, in any patient under an acute diſtemper, ſome ſymptoms which are the effects of one morbid quality, and others that are produced by a different one, we may conclude, that his diſtemper did ariſe from, and depends upon, *complex* morbid qualities; and be inſtructed to compound the medicines with different ſorts of *alterants*, adapted to deſtroy thoſe morbid qualities which produced the diſeaſe.

§ 310. II. Another ſort of morbid qualities are thoſe which bring on chronical diſtempers.

The principal of theſe are the following, viz.

§ 311. 1. The *acid acrimony*. This is chiefly to be met with in *infants* and *children*; and likewiſe in thoſe adult perſons who live much on *acid* or *aceſcent* aliments: and this quality chiefly ſubſiſts in the humours of the *primæ viæ*; that is, in the ſtomach and inteſtines.

§ 312. The SIGNS which diſcover that this quality ſubſiſts in the patient are the following, viz.

1. Sour BELCHINGS, which are the effects of acid particles emitted from the ſtomach through the mouth, &c.

§ 313. 2. A keen APPETITE: but this ſymptom alone cannot be an evidence of an *acid* acrimony in the *primæ viæ*; becauſe an *alkaline* diſſolvent acrimony, in the digeſtive humours, may excite a great appetite to food, e. g. as in the diſeaſe called the *canine* appetite.

§ 314. 3. FLATULENCIES are another ſign, but not alone: becauſe *flatulencies* frequently ariſe in the ſtomach, when aliments of a quality very contrary to that of the contents of the ſtomach, are eaten or drank; whether that quality be *alkaline*, or *acid*, &c.

§ 315. 4. The HEART-BURN. What has been obſerved concerning the foregoing ſigns may be ſaid of this.

§ 316. 5. Stools, which ſmell *ſour*. This ſymptom, indeed, with the firſt mentioned, puts the matter out of doubt; and plainly evinces that the morbid acrimony is of an acid nature: but there may be different ſorts of acid in the contents of the ſtomach, &c. as well as out of the body, &c.

§ 317. 2. An *alcaline acrimony* is another productive cauſe of chronical diſeaſes. We may conclude this to be the morbid quality, if the patient has lived much on *alcaleſcent* vegetables, and on animal foods; and has not uſed ſufficient exerciſe, and is afflicted with pains, &c.

§ 318. 3. A *glutinous quality*. I call that a glutinous quality, which reſults from particles diffuſed in the blood, which naturally attract each other, and cohere ſtrongly together when united.

§ 319. That this is the caſe in many *chronical* diſtempers is evident from the appearance of the blood taken from patients under them.

For it appears very *ſizy*, and the *ſerum* often has a *gluiſh feeling*; and by feeling it, we may perceive the glutinous quality of it.

§ 320. But there is a great variety of different degrees of this *quality* (§ 318.) that is, different degrees of *force* in the coheſion of the particles, which conſtitute the *ſize* which we ſee on the ſurface of the blood, after it has ſtood a ſufficient time in a cool place.

§ 321. This quality may be known by ſuch ſigns as the following, viz.

1. A *heavy*, *dull pulſe:* becauſe, when ſuch a quality ſubſiſts in the blood, there is too ſmall a proportion of red globules, and too ſmall a quantity of nervous fluid ſecreted by the *cerebellum:* and hence the motion of the blood and the action

of the heart become more languid, and the pulſe heavy and dull.

§ 322. 2. A *chillineſs* in the fleſh, for the like reaſons.

3. A *ſluggiſhneſs* in the diſpoſition of the patient.

4. *Cold ſwellings*, &c.

§ 323. 4. The next morbid quality, productive of chronical diſeaſes, is the *pinguedinous* or *oleaginous* quality: but this is not in the fluids of very thin and meagre bodies, let them feed ever ſo heartily; becauſe thoſe acrimonious and very diſſolvent particles in their blood, and in the digeſtive humours ſecreted from it, which occaſions their aliments to paſs ſo quickly through them as to prevent any increaſe of fleſh or fat, do, *at the ſame* time, effectually prevent this morbid quality from coming into exiſtence.

§ 324. This quality only ariſes in perſons that feed pretty much on *mealy*, *fat* and *oily* aliments; and who have not a ſufficiency of the natural, diſſolvent quality in their digeſtive juices.

§ 325. We have therefore reaſon to apprehend, that this quality ſubſiſts in the blood, when we obſerve the following ſigns, viz.

1. A ſmall appetite.

2. A deficient, bad digeſtion. And,

3. A fat habit of body, and a propenſity to increaſe in fat and bulk, notwithſtanding the quantity of the *ingeſta* is very moderate, and exerciſe daily uſed.

§ 326. 5. A *ſcorbutic*, *ſaline* quality is a ſubject of importance.

This general ſort might be ſubdivided into various *ſpecies*, had we adequate ideas of the ſeveral kinds of *ſalts*, which produce the different *ſpecies* of the *ſcurvy*, and different cutaneous diſtempers; and had we likewiſe proper terms or words, by which to denominate, deſcribe, and diſtinguiſh one *ſpecies* of *ſcorbutic ſaline* particles from another.

§ 327. It has been made evident by microſcopical obſervations, that the ſaline particles in different *minerals* and in different *mineral waters*, and thoſe produced by chemical operations from different ſubſtances, have very different figures and textures.

§ 328. And the different kinds of ALIMENTS, both *vegetable* and *animal*, abound with different kinds of *ſaline* particles; and conſequently various ſorts of *ſaline* particles are in the *chyle*, paſs into the blood, and mix with it.

§ 329. And what *neutral* SALTS may be produced by the mixture of different ſorts of aliment, one with another; and again by their mixture with the animal ſalts, which pre-exiſted in the blood, it is impoſſible to deſcribe.

§ 330. But we have reaſon to think that there is a variety of *kinds* of *ſaline* particles in different bodies, living on different ſorts of aliments; and likewiſe in the ſame perſons upon changing their diet.

§ 331. The various *cutaneons* DISTEMPERS which happen to different *ſcorbutic* bodies, do plainly ſhew, that there is a *ſpecific* DIFFERENCE in the ſcorbutic ſalts of one perſon from thoſe of another, be the cauſes of that difference what they will.

§ 332. For the *ſaline* humour, which produces the diſtemper we call the *itch*, will never produce the *impetigo*, or *leproſy*, *et vice verſa*.

§ 333. The infection of the *leproſy* produces the *leproſy*, as the infection of the *itch* produces the *itch:* but as the effects of different *cutaneous* diſeaſes are *ſpecifically* different the one from the other, ſo the cauſes, or the ſcorbutic ſalts productive of them, we may conclude, are ſpecifically different too.

§ 334. It is indeed impoſſible to deſcribe the different figures and textures of the various kinds of the *ſcorbutic*, *ſaline* PARTICLES: but if, in practice and experience, effectual remedies have been found out for *altering* the *ſcorbutic*, *ſaline* quality, predominant in this or that ſort of SCURVY, it may ſatisfy and content us, and be ſufficient to anſwer the wants and deſires of our patients under ſcorbutic diſeaſes.

§ 335. And that there are ſuch remedies will be ſhewn in their proper places.

§ 336. DEFICIENCIES in the quantities of the animal fluids being one claſs of the cauſes productive of diſtempers (§ 188.) it is requiſite to conſider theſe ſigns, from which we may conclude that there is a deficiency in the quantity of the blood, of the lymph, and of the nervous fluid.

§ 337. VII. It is of moment rightly to judge when the quantity of blood is leſs than it ought to be. Here I may obſerve, that the quantity of the blood is *too little* in all *chachecic*, *leucophlegmatic* bodies; and in all who are afflicted with *intermitting* fevers; and in other diſtempers ariſing from a poor and *ſizy* blood; as hath been evident from inſpecting the blood which has been taken from ſuch perſons.

§ 338. In the caſes mentioned (§ 337.) the quantity of *red globules* does not bear a juſt proportion to the *ſerum* of the blood, but is much leſs than the ſtandard of health requires.

§ 339. We may therefore ſay that ſuch a perſon's blood is in quantity *deficient*; becauſe blood is a compound fluid, and the *red* globules doubtleſs are one *eſſential* part of it; and therefore, when this is deficient in quantity, we may affirm that the quantity of the blood is leſs than it ought to be.

§ 340. We may know likewiſe that the quantity of the blood is *too little* or deficient by the following ſigns, viz.

1. A *weakneſs* of the pulſe: becauſe this ſhews that the nervous fluid has *not* been ſecreted in due quantity; and becauſe a deficiency in the quantity of this ſecretion ſhews a deficiency in the quantity of the blood. It is eaſy to apprehend, that when the quantity of the blood is *too little*, the quantities of the humours ſecreted from it muſt likewiſe be *too little*; we may rationally conclude from a deficiency in the quantities of the fluids ſecreted, that there is a deficiency in the quantity of the blood. And this, in my apprehenſion, is a cogent argument againſt taking away blood from perſons who have not too much, &c. becauſe that *evacuation* from ſuch bodies will render the quantity of the important fluids ſecreted from the blood leſs than it ought to be.

§ 341. 2. An habitual *chillineſs* or *coolneſs* of the body; that is, when it is habitually leſs warm than in time of health, is another *ſign* of the ſame ſignification, as may well be inferred from the reaſons now mentioned, (§ 340.)

§ 342. 3. A *feebleneſs* of the natural and animal functions, for the ſame reaſons (§ 340.) may be reckoned another diagnoſtic ſign that the quantity of the blood is too little.

§ 343. 4. If any large, ſpontaneous *hæmorrhage* has happened to the patient, or a great loſs of blood by wounds, we may conclude that the quantity of his blood is leſs than it ought to be.

§ 344. 5. If the patient was not *plethoric*, and yet had been blooded, and it may be ſeveral times, before we ſee him, we may draw the ſame concluſion: it is needful therefore to inquire whether he had any ſymptoms of a *plethora* before his ſickneſs.

§ 345. 6. If he has been ſick ſeveral days, and his body is in a *waſting* ſtate, and his ſtrength daily declining, we may be ſure there is a deficiency in the quantity of his blood.

§ 346. ACUTE diſtempers ſoon occaſion a diminution of the quantity of the blood, as will be manifeſt, if we conſider that perſons ſeized with them, immediately looſe their appetites to their cuſtomary food, and cannot take their uſual quantities of *aliment*; and yet that the expences from the blood are continually making, and their ſtrength daily growing leſs.

§ 347. VIII. The SIGNS which ſhew a deficiency in the quantity of the *lymph* are chiefly the following, viz.

1. Extreme *heat* of the body, as in ardent fevers, which forces the thinneſt parts of this fluid to perſpire and paſs out of the body; and at the ſame time inſpiſſates the blood, and hinders or abates the ſeparation of the *lymph* from it into the *lymphatic* arteries.

§ 348. 2. When the fleſh is very *dry*, and as it were parched, it is a ſign of the like ſignification: becauſe if there was a ſufficient quantity of the *lymph* flowing through the *lymphatic* veſſels, the fleſh could not be in ſuch a *dry* and *parched* ſtate.

§ 349. IX. As to the SIGNS which indicate a deficiency in the quantity of the *nervous* fluid, it may be obſerved, that thoſe which ſhew that the quantity of the blood is *too little*, do alſo manifeſt that the quantity of the *nervous* fluid is leſs than it ought to be: becauſe a ſufficient quantity of this fluid cannot be ſecreted from an inſufficient quantity of blood.

§ 350. Therefore the following particulars ſhould be allowed as ſigns ſignifying that the quantity of the *nervous* fluid is *too little*, viz.

1. A weak pulſe.

2. An habitual chillineſs, or a deficiency in the vital heat.

3. A feebleneſs in the performance of the vital, natural, and animal functions.

§ 351. 4. Great loſs of blood, either by ſpontaneous hæmorrhage or from wounds. To which may be added,

5. Exceſſive evacuations of any other kinds.

§ 352. 6. A long want of appetite, or an incapacity of receiving and digeſting ſufficient quantities of aliment, to ſupply the daily expences of the blood.

7. Great fatigues, or exceſſive labours.

8. Continued ſickneſs at ſtomach, eſpecially under acute diſtempers.

9. Frequent faintings; or faintneſs, which is a diſpoſition to fainting.

10. A too great propenſity to ſleep.

11. A conſtant lowneſs of the ſpirits, hebetude, and dullneſs.

§ 353. Here it may be obſerved, that all diſeaſes reſulting from, or attended with, a *deficiency* in the quantity of any of the animal fluids, do need for their cure ALIMENTS and medicines out of that claſs of medical inſtruments which we call reſtorative.

§ 354. It may not be uſeleſs to remark the ways by which DISEASES put a period to life; becauſe a due attention to them may guide our endeavours very much to the benefit of the ſick.

§ 355. Immediately before the death of an animal body, there proceeds a ceſſation of the *reſpiration* and of the *circulation* of the blood.

§ 356. And the moſt frequent cauſes which make the reſpiration to ceaſe, and which ſtop the circulation of the blood, are the following, viz.

1. That INSPISSATION or thickening of the blood, which renders it *unpaſſable* through the extremities of the capillary ſanguine arteries, into the capillary ſanguine veins: and it is eaſy to apprehend, how ſuch a thickneſs of the blood may firſt render the motion of it ſlower through the minuteſt arteries, and at the ſame time quicker through the larger; and then as the *ſpiſſitude* of it increaſes, the blood may become unpaſſable from the capillary arteries into the capillary veins: the conſequence of which is a ſtop or period to the circulation.

§ 357. And as to the *reſpiration*, the inſpiſſated blood, paſſing too ſlowly through the capillary ſanguine veſſels of the lungs, muſt keep them too much diſtended, and render the contractions of the air-veſicles leſs in expiration; and conſequently the reſpiration quicker and quicker, as the *ſpiſſitude* of the blood increaſes, till there is a total ceſſation of the action of the lungs; that is, till death.

§ 358. This ſeems to be the way in which death happens to perſons under *ardent* fevers; and in caſes wherein by poiſons the blood is coagulated to a mortal degree; and in all fevers produced by the bite of a mad dog, or viper.

§ 359. And indeed a certain exceſs or degree of heat will, in a few minutes, ſo much inſpiſſate the blood, as to render it unpaſſable from the arteries into the veins. I may add, that intenſe COLD will alſo coagulate the animal fluids, and render them unpaſſable through their veſſels, and put a period to life; which is the caſe of perſons frozen to death.

§ 360. We may, from the conſideration of this firſt general cauſe of death, (§ 356.), learn the importance of uſing thoſe medicines which have a *diſſolvent* quality, and are proper to render the blood thinner, and its circulation eaſy, when the diſeaſe is produced by, and depends on, too great a *ſpiſſitude* of the animal fluids.

§ 361. And we may know when this cauſe ſubſiſts, by the ſigns which have been mentioned (§ 265.)

§ 362. 2. Another immediate cauſe of death is that CONSTRICTION of the muſcular fibres and animal veſſels which is inconſiſtent with their natural, vibrating motion: ſuch a conſtriction will immediately ſtop the *reſpiration*, and alſo the circulation of the blood, and put an end to life.

§ 363. Thus it is when perſons die ſuffocated with the fumes of burning *brimſtone* or *charcoal*; or with the *effluvia* of any other ſubſtance that has a like ſtrong, conſtringent quality.

§ 364. While life continues, there is an alternate *contraction* and *dilatation*, or diſtenſion of the animal veſſels; or a reciprocal action and re-action: and that which conſtringes the veſſels ſo much as to ſtop thoſe motions, does at the ſame time put a period to life.

§ 365. But I do not know that this is the caſe in any *chronical diſtemper*, nor in any acute diſeaſe, except in ardent fevers, when the heat is ſo intenſe as to render the muſcular fibres *rigid* to a degree that the veſſels cannot be dilated by the force of the blood's motion, but remain in a ſtate of contraction.

§ 366. However, we may hence learn, that in diſeaſes attended with a rigidity of the veſſels, great care ſhould be uſed to direct ſuch *medicines* and *diluents* as may moſt effectually remove this ſymptom.

§ 367. 3. That general RELAXATION of the muſcular fibres of the HEART and arteries, and other animal veſſels, which renders them incapable of their natural, *contractile* motion, will make the circulation of the blood to ceaſe, and conſequently put an end to life.

§ 368. This is evident; becauſe, if the *contractile* motion of the heart and arteries ceaſes, the *blood cannot be ejected* from the heart into the *aorta*, nor propelled through the arteries into the veins.

§ 369. This general *relaxation* may be produced by various cauſes; particularly,

1. By a great deficiency in the quantity of the blood, and of the *nervous* fluid ſecreted from it: for ſufficient ſupplies of the fluid, ſecreted by the *cerebellum*, are neceſſary to keep up the ſtrength of the vital organs, and prove an increaſing relaxation of the veſſels: and in proportion to the diminution of the healthful quantity of nervous fluid will be the abatement of the vital ſtrength: and in like manner, as a deficiency in the quantity of the nervous fluid increaſes, ſo the diminution of the muſcular ſtrength and relaxation of the veſſels will be increaſed too.

§ 370. And as it is by means of the *nervous* fluid, that the heart and arteries exert their natural contractile force, ſo when the quantity of that fluid becomes diminiſhed to a certain degree, the contractile power, naturally reſident in the heart and arteries, muſt ceaſe; and a general relaxation of the veſſels and death will be the immediate conſequence.

§ 371. And it ſhould be conſidered, that during the progreſs of diſeaſes, eſpecially of thoſe that are *acute*, as the quantities of the aliment taken into the ſtomach are generally much leſs than in time of health, and the evacuations from the body, of one ſort or other, are frequently larger than in time of health, ſo there is daily a diminution of the patient's ſtrength; and therefore we have reaſon to think the quantity of the nervous fluid is daily decreaſing; and conſequently that death may this way be brought on.

§ 372. We may judge how the deficiency in the quantity of the nervous fluid increaſes, by taking notice of the growing weakneſs of the *pulſe*, and of the performance of the vital, natural, and animal functions.

§ 373. And hence we may learn, that CORDIALS of one kind or other become needful and uſeful remedies for the patient in the progreſs of his ſickneſs, almoſt under every diſeaſe.

§ 374. This (§ 373.) is a point worthy conſideration; becauſe the obſervance of it is a means neceſſary to preſerve or reſtore the ſtrength of the action of the vital organs, which is the *vital indication*; and neceſſary to continue the *contractile* power in the muſcular fibres and animal veſſels, which is abſolutely neceſſary to the duration or continuance of life.

§ 375. The general *relaxation*, mentioned § 367, may be produced by any particles of matter diffuſed in the blood, that have a very ſtrong, *diſſolvent* quality.

§ 376. For ſuch particles of matter may deſtroy the conſiſtence of the animal fluids; and by dividing and ſubdividing their globules, may reduce them to that *minuteneſs* which will occaſion *hæmorrhages* or *colliquative ſtools*, or *urines*, or *ſweats*; and likewiſe ſo far diminiſh and weaken the COHESION of the component parts of the muſcular fibres, as that no *contractile* power ſhall remain in the animal veſſels, but an univerſal relaxation of them enſue: the conſequence of which is immediate death; or a period both to reſpiration, and the circulation of the blood.

§ 377. Thus it often happens to perſons in the progreſs of *putrid* fevers, attended with a *feeble*, *languid* pulſe, with a diminution of the vital heat; and more eſpecially if attended with languors, hæmorrhages, or colliquative evacuations.

§ 378. Hence we may conclude, that in all fevers, produced by *diſſolvent cauſes*, two things are neceſſary, viz.

1. The directing ſuch medicines as are proper to alter or deſtroy the *diſſolvent* quality, or the texture of thoſe diſſolvent particles which produced the diſeaſe.

2. The ordering ſuch a *diet* as may ſtrengthen the coheſion of the component parts of the muſcular fibres, and preſerve the *contractile* power of the animal veſſels, as well as nouriſh the body.

END of LECTURE III.

LECTURE IV.

On morbid ſymptoms. I. *On the different kinds of pulſe.* II. *On the temperature of the fleſh.*

§ 379. *MOrbid ſymptoms* are next to be treated on in the courſe of theſe lectures, as to their cauſes, ſignifications, and curative indications; by the knowledge of which a phyſician diſtinguiſhes one diſtemper from another; and having learned the nature of his patient's diſeaſe, thence infers the proper means for curing it.

§ 380. MORBID SYMPTOMS are the effects of ſome cauſe producing a diſtemper which we diſcover by examining the ſick.

§ 381. Theſe ſymptoms may be diſtributed into the following claſſes, viz.

I. Thoſe which happen in the ſtate of the pulſe.

II. Thoſe which happen in the temperature of the fleſh.

III. Thoſe of the *head.*

IV. Thoſe of the *reſpiration*, or breathing.

V. Thoſe of the *urine*, as to the quantity and quality.

VI. Thoſe of the *ſtools*, too ſeldom or too frequent; and as to the quantity and quality.

VII. Thoſe of the *inſenſible perſpiration*, being too much or too little.

VIII. Thoſe of incidental evacuations, viz. by 1. Spitting, 2. Vomiting, 3. Sweating; and 4. Hæmorrhages.

IX. Thoſe of *pains*; as to their cauſes and qualities, and the parts affected with them.

X. Thoſe which appear on the external ſuperficies of the body.

XI. Thoſe of the *nervous* ſyſtem. All which claſſes I propoſe to conſider in their order.

§ 382. I. We ſhall conſider the *morbid* ſymptoms which happen in the ſtate of the pulſe.

§ 383. We are to underſtand by this expreſſion, viz. *the pulſe*, the motion of the blood againſt the ſides of the ſanguine arteries, occaſioned by the contractions of the left ventricle of the heart ejecting into the *aorta*, and propelling one quantity of blood after another through the arterial veſſels into the veins.

§ 384. The MOTIONS of the blood, and the ſenſations produced by them in the finger of the perſon that examines them, are liable to a great variety of alterations; and this is the reaſon of giving different characters or denominations to different ſorts of pulſation againſt the ſides of the arteries by the blood.

§ 385. But before I treat on the different *morbid* PULSES, it may be proper to deſcribe that which is healthy. This PULSE is *equal* as to time and force; and is moderately *ſtrong*, *large*, and *ſlow:* and it ſhews that there is a due quantity of red blood, and ſufficient influxes of liquid from the *cerebellum* to the nerves of the heart; a due ſtrength in the action of the heart and arteries; an eaſy circulation of the animal fluids: and it ſignifies that both the *ſecretions* and *excretions* are ſufficiently made. But in perſons of different conſtitutions and of different ages, although in health, there is nevertheleſs ſome differences as to the time and ſtrength of the pulſes, and likewiſe as to equality.

§ 386. And as to the *morbid* SYMPTOMS of the pulſes, the moſt frequent and remarkable are the following, viz.

§ 387. I. The *quick* PULSE: that is, when the pulſations or motions of the blood againſt the ſides of the arteries are quicker than in the time of health.

§ 388. There are manifold different degrees of quickneſs, but they all proceed from the ſame cauſe, and have the ſame ſignification: only it muſt be conſidered, that the quicker the pulſe is, the more reaſon we have to conclude that the cauſe producing the diſeaſe is ſtronger, and the danger of the patient greater; eſpecially in *acute* diſtempers.

§ 389. It may be difficult to ſpecify all the antecedent and remote cauſes of this ſymptom; and it may ſuffice if we know the immediate cauſes of it, and how to remove them. We meet this ſort of pulſe in *moſt* fevers; and it is one diſtinguiſhing ſign, with ſome others, that occaſions us to call the patient's diſeaſe a *fever*.

§ 390. We likewiſe meet with this ſymptom in ſome young bodies under obſtructed habits, and in ſome chronical diſtempers; as in *hydropical* and *hectical* patients.

§ 391. And as for the cauſes productive of this kind of pulſe, I may aſſign the following, viz.

1. *Quicker* or more frequent contractions of the heart; becauſe without this the impulſes of the blood againſt the ſides of the arteries could not become more quick.

§ 392. And, 2. Quicker influxes of liquid from the *cerebellum*, or leſſer brain to the heart and other vital organs; becauſe without theſe the contractions of the heart could not become more frequent.

§ 393. The action of the heart and the ſecretion by the *cerebellum* are reciprocal; and have a mutual influence one on the other.

§ 394. For by means of more frequent contractions of the heart, blood is carried quicker to the brain, which may occaſion a quicker ſecretion of the nervous fluid, and influxes of it into the nerves: and it is as hard to determine whether the action of this or that organ is prior, as it is to ſay which is the prior point in a circular motion, or the firſt point moving in the circumference of a wheel in its rotation.

§ 395. I may obſerve, 3dly, That obſtructions in ſome of the capillary ſanguine arteries from *viſcid* humours, or particles *too large* to paſs eaſily through them, may occaſion the motions of the blood, through thoſe arteries that are larger and not obſtructed, to be quicker, or to flow faſter into the ſanguine veins; and through them to the right auricle and ventricle of the heart, and thereby render their *diaſtole* and *ſyſtole* more frequent; and conſequently the flux of the blood through the lungs, and the *diaſtole* and *ſyſtole* of the left *auricle* and *ventricle* of the heart alſo, more quick.

§ 396. This ſeems to be the cauſe of this ſymptom, when we meet with it in patients whoſe diſeaſes were produced by, and depend upon a *viſcid* quality of the blood, or on particles diffuſed in it *too bulky* for an eaſy paſſage through all the minuteſt ſanguine arteries.

§ 397. I may add, 4thly, That *acrid*, ſtimulating particles mixed with the blood (too large to enter into any ſeries of veſſels whoſe diameter is leſs than that of the ſanguine veſſels) may irritate the heart and arteries to more frequent contractions.

§ 398. We may, from theſe obſervations, know, that the morbid ſymptom, now under our conſideration, ſignifies, either that there is a viſcid quality in the blood or particles acrid and ſtimulating, or too bulky for an eaſy circulation through all the minuteſt blood veſſels; and it may be known which of the cauſes mentioned produced the ſymptom, if we take due notice of the concomitant ſymptoms.

§ 399. Thoſe medicines therefore which may remove the particular cauſe of this ſymptom in this or that patient, and render the pulſe ſlower till it comes to its natural ſtate, are the proper remedies.

§ 400. 2. The *ſlow* PULSE: that is, when the motions of the blood againſt the ſides of the arteries are ſlower than in the time of health.

§ 401. This ſymptom is produced by cauſes of a nature contrary to thoſe on which the *quick* pulſe depended; and hath a contrary ſignification.

§ 402. This ſort of PULSE ſeems to be occaſioned by a deficiency in the quantity of the nervous fluid ſecreted by the *cerebellum:* and the reaſon of that deficiency, as I apprehend, is the want in the blood of a ſufficient quantity of thoſe ſubtile particles, which are neceſſary to conſtitute the fluid of the nerves.

§ 403. And as it proceeds from too ſlow conſtructions of the heart, and too ſlow influxes of the nervous liquid from the *cerebellum*, ſo it ſignifies that the quantity of the nervous fluid is *too little*, and hardly ſufficient to enable the animal organs to act with that vigour which is requiſite to the recovery of the patient.

§ 404. This ſort of pulſe ſhews, that there is no *rarefaction* of the blood, nor obſtructions in the capillary veſſels; and it ſhews, likewiſe, that aliments eaſy to be tranſmuted into blood, and proper *cordials*, are much wanted for the ſupport of the ſick.

§ 405. 3. A *full* PULSE: that is, a pulſe *fuller* than in time of health; when by the motion of the blood againſt the ſides of the arteries we perceive that they are diſtended more than uſual, by every quantity of blood injected by the heart into the *aorta*.

§ 406. This greater diſtention of the arteries ſhews, either that the quantity of blood is greater than in time of health; or that the blood is under a *rarefaction.*

§ 407. Here it ſhould be obſerved, that if, before the patient's ſickneſs, there were no SIGNS of a ſanguine *plethora*, if this fulneſs of the pulſe occurred within a few hours, or even days after the beginning of his diſeaſe, we ought in reaſon to conclude, that it ariſes from a *rarefaction* of the blood; becauſe ſuch an increaſe of the real quantity of it could never be effected in ſo ſhort a time, even in a ſtate of health.

§ 408. This conſideration will teach us, that when we find in any patient a full pulſe, without preceding ſigns of an exceſs in the quantity of the blood, we are not to adviſe bleeding, as if there was a *plethora*, or an exceſs in the quantity of the blood, but to direct ſuch remedies as may take off the morbid *rarefaction*, which is a wrong quality ſubſiſting in it that ought to be removed: for which purpoſe *refrigerating*, *ſaline* ALTERANTS I have often found very effectual.

§ 409. 4. An *empty* PULSE is a ſymptom oppoſite to the former: and it is that motion of the blood againſt the ſides of the artery which ſhews that it is not ſo full of blood as in the time of health: in this caſe we find the artery leſs diſtended by the quantities of blood thrown into it by the heart.

§ 410. This rarely happens in the beginning of any diſeaſe, except ſome great *hæmorrhage* has preceded, or the diſtemper is of a very *putrid* or peſtilential nature, diſſolving the component parts of the blood; but it more frequently occurs in the *progreſs* of the ſickneſs, and then ſhews a deficiency in the quantity of the blood, and of the nervous fluid ſecreted from it; and that the patient is in extreme danger; and that a *cordial diet* and *cordial medicines* are neceſſary for his recovery.

§ 411. 5. The *hard* PULSE: that is, when the impulſes of the blood againſt the ſides of the artery are harder than in time of health. This ſort of pulſe is produced partly by a *ſizy* blood, becauſe the blood taken from perſons who have this ſymptom (as in pleuriſies) appears to be *ſizy:* and partly by *ſtronger* motions of the blood againſt the ſides of the artery, reſulting from *ſtronger* contractions of the heart, and a larger influx of liquid from the *cerebellum* to the heart.

§ 412. Such is the pulſe in all genuine pleuriſies, and in ſome other inflammatory fevers, where not the *pleura* but ſome other membranes are the parts chiefly inflamed.

§ 413. This ſort of pulſe, whenever we meet with it, ſhews the neceſſity of preſcribing ſuch *alterants* as may free the blood from its *ſizy* quality, and abate the force of the contractions of the heart.

§ 414. And it ſhould be obſerved, that though the pulſe in *pleuriſies* and ſome other inflammatory fevers be *hard*, *ſtrong*, and *quick* in the former part of the diſeaſe, yet in the progreſs of it, when that tends to put a period to life, the ſtate of the pulſe changes, becoming leſs hard, quicker, and weaker, till the action of the heart entirely ceaſes.

§ 415. 6. The *ſoft* PULSE: that is, when the pulſations of the artery againſt the finger (that feels it) are more *ſoft* than in the time of health.

§ 416. This kind of pulſe ſeems to be the effect *partly* of a LAXITY of the muſcular fibres that compoſe the coats of the artery, which renders it eaſily dilatable by the flowing blood, and incapable of ſo much reſiſtance as might make the force of the blood's motion more perceptible; and partly it is the effect of a *deficiency* in the quantity

of

the *red blood*, and of the fluid ſecreted by the *cerebellum.*

§ 417. For this ſymptom ſeldom happens in the beginning of diſeaſes, unleſs in fevers from very diſſolvent cauſes, quickly deſtroying the conſiſtence of the blood, and dividing and ſubdividing its globules: and therefore, when we meet with it, after the diſeaſe has been of ſome days continuance, we have reaſon to conclude, that the blood and nervous fluid are become deficient in quantity; and are to judge this to be a bad ſign, ſhewing that the recovery of the patient is very doubtful.

§ 418. And this ſhews alſo the neceſſity of ordering a *nutritious* diet and *cordial* medicines; and that directing a diet which affords but little nutriment, and with-holding from the ſick, in ſuch a caſe, ſuitable *cordials*, is only like to haſten the period of life.

§ 419. 7. A *ſtrong* PULSE: that is, when the pulſations of the artery againſt the finger that feels it are *ſtronger* than in the time of health, is a *morbid ſymptom*, as it is a variation from the ſtandard of health.

§ 420. This ſort of pulſe is produced by *ſtronger* contractions of the heart and a more copious influx of liquid from the *cerebellum* to the heart.

§ 421. In all fevers attended with a ſtrong and quick pulſe, there is a much greater quantity of blood every minute carried by the carotid arteries to the brain, than in time of health; and therefore we have reaſon to apprehend, that there may be a quantity of nervous fluid ſecreted by the brain every minute greater than in the time of health, while the pulſe continues in ſuch a ſtate, and while there remains in the blood the ſame quantity of matter fit to conſtitute the fluid of the nerves, and ſecernable from it.

§ 422. And this ſeems to be the cauſe of the ſymptom now under conſideration, and likewiſe of that watchfulneſs which ſo frequently happens to perſons under fevers, eſpecially in the beginning of them.

§ 423. This ſymptom indeed ſhews, while it laſts, a ſufficient quantity of blood and of the nervous liquid, a free circulation of the animal fluids, and a freedom at leaſt from any conſiderable obſtructions; and is an hopeful ſign.

§ 424. But it ſhould be obſerved, that, if the diſeaſe continues, the quantity of the blood and nervous fluid will become leſs than it ought to be; and this pulſe will then ſink into another ſort, viz. *weak* and *quick*.

§ 425. When the pulſe is ſtronger than in a time of health: if there was no exceſs in the quantity of the blood before the patient became ſick, there is no great reaſon to ſuppoſe that it became exceſſive afterwards; but we ſhould rather conclude, that the ſtrong contractions of the heart, which produce the ſymptom, proceed from ſome ſtimulating particles mixed with the blood; we ſhould, therefore, in this caſe, endeavour to remove the acrid ſtimulating quality from the blood by proper alterants, in order to reduce the force of the pulſe to the ſtandard of health.

§ 426. 8. A *weak* PULSE; that is, a pulſe *weaker* than in a time of health: this commonly follows a deficiency in the quantity of the blood, and of the nervous fluid ſecreted by the *cerebellum*; and as the deficiency of thoſe fluids increaſes, the weakneſs of the pulſe does likewiſe increaſe.

§ 427. This ſort of pulſe generally happens in the progreſs of diſeaſes; and is always a threatening ſymptom, in proportion to the degree of it; and requires the ſame diet and medicines as the *ſoft* pulſe.

§ 428. 9. An *equal* PULSE: that is, when the pulſations of the artery againſt the finger are equal as to *time* and *force*: this is produced by equal contractions of the heart both as to *time* and *force*; and by equal influxes of the nervous fluid from the *cerebellum* to the heart; and it is a good ſign; and the methods of managing the ſick ſhould be directed by the concomitant ſymptoms.

§ 429. 10 An *unequal* PULSE: and two ways the pulſe may be unequal, viz. as to *time* and as to *force*.

§ 430. The pulſe is unequal as to *time*, when ſome of the pulſations of the artery are *quicker*, and others *ſlower*, or more diſtant from each other: and this inequality is the effect of unequal contractions of the heart as to time, and unequal influxes of fluid from the *cerebellum* to the heart.

§ 1. And this (§ 430.) ſeems to ariſe from an unequal *viſcidity* and *fluidity* of the blood. It is pretty eaſy to apprehend, that when the more *viſcid* parts of the blood are propelled to the minuteſt, capillary ſanguine arteries, their motion through them into the capillary veins muſt be ſlower than when the thinner parts of the blood are paſſing through them: conſequently, that while the more *viſcid* humours are paſſing, there will be a reſiſtance of the influx of the blood from the heart into the *aorta*; which muſt occaſion the contractions of the heart to be ſomewhat *ſlower* as to time.

§ 432. And this retarding of the actions of the heart may occaſion a retarding of the influx of fluid from the *cerebellum* to the heart.

§ 433. This ſymptom (§ 429.) therefore ſhews the importance of directing ſuch medicines as may *alter* and remove the viſcid quality of the blood, and recover it to its natural tenuity.

§ 434. The pulſe is unequal as to *force*, or ſtrength, when ſome of the pulſations of the artery are ſtronger, and others weaker. The cauſes of this ſymptom are an inequality in the force of the contractions of the heart, and an inequality in the quantities of the fluid tranſmitted from the *cerebellum* to the heart.

§ 435. And as this ſymptom rarely occurs in the beginning of a ſickneſs, not even in acute fevers (except thoſe from *diſſolvent* cauſes) but is to be met with in the progreſs of them, ſo we have reaſon hence to think it is occaſioned by a deficiency in the quantity of the blood, and nervous fluid ſecreted from it.

§ 436. And hence appears the neceſſity of *directing* for ſuch patients aliments that will afford a *nutritious* chyle, eaſy to be tranſmuted into blood; and *cordial* medicines, which may invigorate the blood, and ſtrengthen the actions of the vital organs.

§ 437. II. An *intermitting* PULSE; is that which in which the contraction of the heart ſtops ſo long a ſpace of time as a ſingle pulſation of the artery commonly takes up.

§ 438. And there is a great variety as to the frequency of theſe ſtops in the motion of the blood; and alſo in the length of the intermiſſion.

§ 439. For ſometimes in telling forty, or more, we ſhall only find one pulſation loſt; at other times perceive an intermiſſion twice or thrice in twenty, or in ten: and ſometimes the intermiſſions are more frequent, and their duration longer; ſo that an intermiſſion ſhall take up the time of two or three pulſations.

§ 440. Here it may be obſerved, that ſome degrees of the *intermitting* pulſe happen to children, and very young and very old perſons apparently in health; but the ſort of intermitting pulſe I am treating on, is that which occurs to our notice in ſick people, and is an effect of the diſeaſe in the progreſs of it.

§ 441. This (§ 437.) ſeems to reſult from the ſame cauſes which produced the *unequal* pulſe, when thoſe cauſes ſubſiſt in a greater degree: and conſequently has the like ſignification, and muſt be acknowledged to be a more threatening ſign: and directs us to adviſe the like diet and remedies for the relief and recovery of the patients.

§ 442. *Complex* PULSES, e. g. *quick* and *ſtrong*; *quick* and *weak*, &c. may be eaſily underſtood, as to their cauſes, ſignifications, and curative Indications, from what has been ſaid in the foregoing ſection.

§ 443. I may obſerve, that there are ſome *variations* in the pulſe peculiar to different *conſtitutions* of body, ages, ſexes, and ſeaſons of the year, the time of ſleep, and the paſſions of the mind, worthy of our notice. And therefore I ſhall mention the following differences, viz.

§ 444. I. As to conſtitutions of body, it may be remarked, 1. That in perſons of the ſanguine conſtitution, i. e. the *hot* and *dry*, the pulſe is rather quicker, ſtronger, and harder than in perſons of a different temperament.

2. That in thoſe whoſe temper of body is *cold* and *moiſt*, of the lymphatic conſtitution, the pulſe is rather *ſlower* and *ſofter* than in others.

§ 445. II. As to age, it muſt be obſerved, that in children the pulſe is rather quicker and ſofter; and that in adult perſons it is greater and ſtronger; and that in aged perſons the pulſe is ſlower and weaker.

§ 446. III. As to different *ſexes*; that in men the pulſe is great, ſtrong, and moderately quick; and in women, not ſo ſtrong nor ſo quick.

§ 447. IV. As to the ſeaſons of the year: that in the *ſpring* the pulſe is commonly ſomewhat fuller and ſtronger than in the preceding *winter*; that in the *ſummer* the pulſe is uſually full, ſtrong, and ſomewhat quicker, by means of the increaſed heat of the air, and ſome *rarefaction* of the blood in conſequence of it: that in *autumn* (as the *ſummer* heat abates) the pulſe becomes ſomewhat leſs full, leſs frequent, and leſs ſtrong: and that in *winter*, the pulſe becomes leſs, *ſlower*, and weaker, than in the other quarters of the year, by means of the coolneſs and moiſture of the air.

§ 448. I may likewiſe obſerve, that in the time of *ſleep* the pulſe becomes more languid and ſlower than in the time of *waking:* becauſe the influx of fluid from the *cerebellum* to the heart is then leſs, as the influx of nervous fluid is likewiſe then leſs from the *cerebrum* into the organs of the ſenſes.

§ 449. But when the paſſion of *anger* becomes violent, the pulſe becomes great, ſtrong, and frequent; becauſe the *ſtimulus* of this paſſion occaſions a more copious and vehement afflux of ſpirits from the *cerebellum* to the heart.

§ 450. GRIEF indeed produces a contrary effect in the ſtate of the pulſe, rendering it leſs, *weaker*, and *ſlower*, as it checks or abates the influx of the nervous fluid from the *cerebellum* to the heart.

§ 451. But the *joyous* paſſions ſtimulate a briſker flow of ſpirits both to the heart and the organs of ſenſe; and the pulſations of the artery are equal, and rather more large and ſtrong than before.

§ 452. Theſe obſervations ſhould be *remembered*, in order to make a right judgment of the differences of the pulſes we may meet with, and a due underſtanding of what is ſignified by them.

§ 453. It appears from what has been delivered concerning the different pulſes incidental to perſons under different diſeaſes, and at different times or periods of their ſickneſs, that much knowledge of the nature of the patient's *diſtemper*, and of what is like to be the event of it, and of what is proper for the cure of it, may be deduced from underſtanding the cauſes and ſignifications of the morbid ſymptoms, which happen in the ſtate of his pulſe through the progreſs of it.

§ 454. And hence likewiſe may be concluded the neceſſity of a phyſician's frequently examining the ſtate of the pulſe in every patient.

§ 455. II. The ſecond claſs of *morbid* ſymptoms comprehends thoſe which happen in the *temperature* of the FLESH.

§ 456. It is a matter of importance to examine into this *temperature* in perſons under ſickneſs; becauſe divers variations from the healthful ſtandard of it may, and often do happen in the time of ſickneſs.

§ 457. And thoſe ſeveral variations are *morbid ſymptoms*, which we ſhould underſtand as to their *cauſes*, their *ſignifications*, and *curative indications*.

§ 458. The moſt remarkable morbid ſymptoms in the temperature of the fleſh are theſe:

1. COLDNESS: that is, when the fleſh is leſs warm than in the time of health; when a patient has that ſenſation, which makes him ſay that he is *cold*; and the perſon that feels him, perceives that he is ſo.

§ 459. But ſometimes a man has ſuch a ſenſation, when the perſon who feels him does not perceive the coldneſs he complains of. This indeed is a morbid ſymptom; but not that under our preſent conſideration.

§ 460. I am now ſpeaking of that *coldneſs* which is perceivable by the phyſician who examines the ſick.

§ 461. Of this there are various degrees; and there are different times of its occurring: particularly very often in the beginning of diſeaſes, and ſometimes in the progreſs of them.

§ 462. I ſhall firſt diſcourſe on that *coldneſs* which happens in the beginning of a diſeaſe.

This (§ 462.) is the introducing ſymptom (if I may be allowed the expreſſion) of very many different ſorts of fevers, both intermitting and continual; it is often the firſt ſymptom perceivable.

§ 463. And, in order to our forming a right notion of it, we may recollect a few things, particularly, 1. That while the force of the action of the vital organs continues in its healthful ſtate; while the contractions of the heart and arteries (as to ſtrength and frequency) remain according to the ſtandard of health; while the circulation of the blood is free and eaſy, and no way obſtructed; the *vital* heat will remain in its natural and healthful degree, and the *coldneſs*, we are ſpeaking of, cannot occur.

§ 464. Therefore, 2dly, when it does occur, we may reaſonably deduce from it theſe *concluſions*, viz. 1. That the contractions of the heart are leſs ſtrong, and leſs frequent; or, in other words, weaker and ſlower than in time of health.

2. That there is an abatement of the influx of nervous fluid from the *cerebellum* to the heart.

3. That the circulation, or paſſing of the blood through the minute capillary ſanguine arteries, is by ſome cauſe or other rendered difficult and ſlow.

§ 465. The truth of theſe concluſions (§ 464.) will be confirmed to every one that ſhall feel and examine the ſtate of the pulſe of any perſon while under this morbid or febrile coldneſs; becauſe he will find it very weak, and very ſlow; and the ſpirits of the patient very languid; and more or leſs ſo, as the *coldneſs* is greater or leſs.

§ 466. The point then to be inquired after is this, viz. what may be the cauſe of the obſtructed, and more difficult and ſlow circulation of the blood; for the cauſe hereof (be it what it will) ſeems to be the ſource of the diſeaſe, and the occaſion of all the ſubſequent ſymptoms.

§ 467. The reſiſtance which the flowing blood meets with muſt needs render the contractions of the heart ſlower, and in conſequence impede the influx of fluid from the *cerebellum* to the heart; whence the action of the heart muſt become leſs ſtrong, and the pulſe weaker.

§ 468. There are three cauſes, either of which may make the paſſing of the blood through the minute capillary ſanguine arteries difficult and ſlow, viz.

1. A certain degree of *ſpiſſitude*, or thickneſs in the conſiſtence of the blood: and this is producible at any time by a certain degree of heat, as appears by the experiments Dr. *Boerhaave* relates to have been made with dogs.

§ 469. And ſo exceſſive hot weather, or heat of the ſun, will ſometimes inſpiſſate the blood to that degree that ſhall render the circulation of it ſlow and difficult, and bring on a morbid coldneſs, ſucceeded by febrile heats. And this is the caſe in *ardent* fevers.

§ 470. 2. A *viſcid* quality of the blood, when it increaſes to a certain *degree*, muſt produce the like obſtructed circulation, or occaſion a reſiſtance to the contractions of the heart, and motions of the flowing blood; and render the pulſe ſlower and weaker.

§ 471.

§ 471. And it is not difficult to apprehend, that the blood may become ſo *ſizy* as not to be capable of paſſing eaſily through the minute ſanguine arteries. And this ſeems to be the caſe in all inflammatory fevers; becauſe, when blood has been taken from perſons under them, the *viſcidity* of it becomes evident to the eye.

§ 472. How the blood contracts ſuch a *quality* is not the ſubject of our preſent enquiry: it is ſufficient for our purpoſe, that we know this morbid quality is the proximate cauſe of many acute diſeaſes; and that we are acquainted with the ſigns which diſcover when it is predominant in the animal fluids; and that we know medicines which have been effectual for removing it.

§ 473. There may be, and often is, ſome degree of viſcidity in the blood *latent*, and not diſcoverable to us: we only know it ſubſiſts, when it is in that degree which produces morbid effects, diſcoverable to us on examining the patient.

§ 474. 3. Particles *too large* for an eaſy paſſage through the capillary ſanguine arteries are ſometimes mixed with the blood, and they may juſtly be reckoned another cauſe of an obſtructed, difficult, and ſlow circulation of it; and conſequently may be productive of the ſymptom of *coldneſs* we are treating of.

§ 475. And this ſeems to be the caſe in *contagious*, eruptive fevers, ſuch as the *ſmall pox*, &c.

§ 476. The infectious, variolous *effluvia* are indeed exceeding minute, and may, and certainly do, enter the bodies of many perſons (who have had that diſtemper before) in great abundance; particularly in nurſes; and mix with their blood, and eaſily circulate with it, and paſs out of the body through the ſeveral excretory veſſels without any ill effects: but when they enter into a body perfectly in health, and produce the diſtemper they then attract, or are attracted by parts of the blood; unite with them, tranſmute them into their own nature, and increaſe in bulk; and ſpread or diffuſe the variolous quality through the animal fluids: and when theſe morbid particles become too large for an eaſy circulation, there happens a reſiſtance to the motion of the blood in its paſſing through the capillary arteries; and thence the contractions of the heart become ſlower and weaker; and then comes on this ſymptom of coldneſs.

§ 477. The cauſes of the morbid *coldneſs* in the beginning of a ſickneſs, having been aſſigned, I may obſerve, that when it occurs, we may from it infer what is the ſtate of the blood in the patient that complains of it, viz. that his blood is either *ſpiſſid*, or *viſcid*, or has *too bulky* particles mixed with it.

§ 478. If the weather has *not* been very hot, if the patient is *not* of a ſanguine conſtitution, nor has overheated his blood by exerciſe, we have very *little* reaſon to think this ſymptom proceeds from a ſpiſſitude of the blood.

§ 479. And if there is *no* contagious eruptive fever among the people to yield *infection* to the ſick, we have no ground to imagine that the ſymptom is produced by particles *too bulky* for an eaſy circulation; but have reaſon then to conclude that it is occaſioned by a *viſcid* quality, and that an *intermitting* or an *inflammatory* fever of one denomination or other will follow upon it.

§ 480. The conſideration of theſe things will direct us how to act, if we are called to a patient ſo early as to find him under this ſymptom.

§ 481. And that when we find reaſon to think the coldneſs was produced by that *ſpiſſitude* of the blood, which brings on *ardent* fevers, we ſhould order ſuch medicines and diluents as are like to thin the blood.

§ 482. If, upon inquiry, we have ground to apprehend the patient became ſick by ſome *infection*, we are then to conſider what ſort of *infection* it was, and to order thoſe remedies which may alter and prevent the increaſe of that morbid quality which ſuch infection tends to produce.

§ 483. And if there are reaſons to imagine that the blood is in an inflammatory ſtate, we ſhall ſee the importance of adviſing ſuch *alterants* as may take off the morbid, that is, *viſcid* quality, from the animal fluids.

§ 484. But it is *not* likely that we ſhall ever be called ſoon enough to ſee the firſt beginning of a diſeaſe; however, it is requiſite that we inquire whether the ſickneſs of our patient began with this ſymptom; and alſo concerning the degree and continuance of it; becauſe the more extreme the *coldneſs* was, and the longer it continued, the more violent and the more dangerous the diſtemper is like to prove.

§ 485. And I may obſerve that *heating* medicines and ſpirituous *cordials* are not only improper for perſons under this ſymptom, but often very pernicious; rendering the ſubſequent febrile heat more violent than otherwiſe it would be, and putting the life of the patient into greater danger.

§ 486. When we have reaſon to think the *febrile coldneſs* was the effect of the ſpiſſitude of the blood (as it ſeems to be the caſe when it happens to a perſon of a *ſanguine* conſtitution, full of blood, and whoſe ſickneſs was occaſioned by exceſſive heat of the air, or by violent exerciſe) then thoſe medicines which are proper to *thin* the blood, and render its motion through the minuteſt veſſels free and eaſy, are ſuitable remedies.

§ 487.

§ 487. When we have ground to apprehend that this ſymptom was brought on by that *viſcid* quality, which commonly introduces inflammatory fevers, we may conclude that ſuch ALTERANTS as may effectually deſtroy ſuch a quality, are the proper remedies.

§ 488. 2. There is another ſort of *coldneſs* which occurs after the diſtemper has made a progreſs, or has been of ſome days continuance; I call it another ſort of coldneſs, becauſe it proceeds from different cauſes.

§ 489. For this (§ 488.) happens after the quantity of the blood has been diminiſhed through the want of the uſual quantities of aliments taken in time of health, and by means of augmented excretions during the courſe of the diſeaſe.

§ 490. This coldneſs therefore, in the progreſs of a fever, is a worſe ſign than the foregoing: it ſhews a *deficiency* in the quantity of fluid ſecreted by the *cerebellum*, reſulting from a deficiency in the quantity of the blood.

§ 491. It likewiſe ſhews that the morbid quality, inſtead of being removed, is ſadly *increaſing* in the animal fluids, notwithſtanding all the medicines that have been given to the patient; and directs us to *alter* our method, and contrive ſome other more powerful for recovering the ſick from the extreme danger that threatens him.

§ 492. When we meet with this ſymptom (§ 488.) it will be needful (beſides proper *alteratives)* to uſe ſome cordials and other reſtoratives; and without them the pulſe will ſoon loſe its vigour, become *quicker* and *weaker*, and the period of life ſoon follow.

§ 493. II. Another morbid ſymptom, occurring in the temperature of the fleſh, is too much HEAT; that is, when the fleſh is hotter than in time of health.

§ 494.

§ 494. For our right underſtanding this ſymptom we ſhould recollect a few things; particularly, 1. That the natural heat of the blood ariſes partly from the element of *fire*, which is made one of the conſtituent parts of an human body, as it is more or leſs a part diffuſed almoſt in all others; and partly from the *friction* of the red globules againſt one another, occaſioned by the *protruſive*, the *lateral*, and *inteſtine* motions, always ſubſiſting in the blood while it has a circulation.

§ 495. There may be a friction of the parts of various ſorts of matter, and yet no heat produced thereby; as *water*, by a meer agitation, though it be ever ſo violent, will not become warm.

§ 496. But if we conſider that the *red globules* of the blood, which are *elaſtic*, do abound with ſulphureous particles, as appears by the ſound they make when caſt on red hot coals, after they have been dried from the *ſerum*, we may eaſily apprehend that heat will be the effect of their friction in a living body.

§ 497. We may be convinced of the juſtneſs of this notion, if we conſider two things, viz. 1. That the heat of the blood increaſes in proportion to the quantity of its red globules, and the increaſe of their friction: as we may infer from perſons growing preſently hotter by labour, or exerciſe of their bodies, which augments the motions of the blood, and increaſes the friction of its globules; and obſerve, that perſons in health, who have a due quantity of red globules, grow ſooner hot by exerciſe, than thoſe who are infirm, and have a poor blood, or fewer red globules.

§ 498. 2. That the heat of the blood decreaſes in proportion to the diminution of the quantity of its red globules, and to the decreaſe of their friction; as is evident from perſons becoming chilly, and complaining of being cold upon the loſs of any conſiderable quantity of blood: as likewiſe from their making ſuch complaints, when their pulſe becomes weak and feeble.

§ 499. 2. It ſhould be remembered that exceſs of the vital heat inſpiſſates the blood and other animal fluids.

§ 500. And this it does, by occaſioning the moſt ſubtile and aqueous particles partly to exhale or perſpire from the body through the cutaneous excretory *tubuli*, and partly to run off through the excretory *tubuli* of the kidneys.

§ 501. 3. That the inſpiſſation or thickening of the blood, or increaſe of its viſcidity, will be greater or leſs as the exceſs of the heat is more or leſs.

§ 502. This ſymptom (§ 493.) therefore ſhews us, that the animal fluids are too thick or viſcid; and that the greater the exceſs of heat is, the greater is the danger of the patient.

§ 503. And we may juſtly infer, that the morbid quality of ſpiſſitude, or viſcidity in the blood, will continue increaſing while this *ſymptom* continues.

§ 504. And that it indicates the importance of preſcribing ſuch medicines as may remove the exceſs of *heat*, and reduce the vital heat to the ſtandard of health; that is, ſuch as will bring the fleſh of the patient to its natural temper.

§ 505. There may be joined with this ſymptom a pulſe too ſtrong, and too quick; and this ſymptom cannot be cured without abating the force and celerity of the pulſe.

§ 506. III. Another morbid ſymptom, happening in the temperature of the fleſh, is TENSENESS; that is, when it feels harder and ſtiffer than in time of health: the patient then feels hot and dry.

§ 507. This frequently occurs in ardent fevers, attended with extreme heat, and proceeds from the ſame cauſes, has the like ſignification, and indicates the uſe of the ſame remedies.

§ 508. IV. Another morbid ſymptom is HEAT and MOISTURE. This is much better than the laſt, but ſhews the neceſſity of endeavouring to abate the heat; becauſe if that ſhould continue and increaſe, the moiſture will ceaſe, and the fleſh become hot and dry.

§ 509. V. A MEAN TEMPERATURE of the fleſh between hot and cold, as in health: when it happens in perſons under *acute* fevers is a *morbid* ſymptom, ſignifying that there is no ſpiſſitude of the blood; therefore indicating that the fever is of the *putrid* kind, and produced by diſſolvent cauſes.

§ 510. VI. FLABBINESS of the fleſh is a morbid ſymptom, ſhewing that there is a *laxity* of the muſcular fibres and animal veſſels, and too great a quantity of the lymphatic fluid; and that ſuch remedies as may leſſen the quantity of the watery humours, and increaſe the coheſion of the conſtituent parts of the animal veſſels, are wanted.

§ 511. VII. A COOLNESS of the fleſh in chronical diſtempers; that is, when the fleſh is habitually cooler than in the time of health; is a morbid ſymptom, and ſhews that the blood of ſuch a patient is *deficient* as to the quantity of *red* globules.

§ 512. But if ſuch a temperature of the fleſh is attended with a quick pulſe, we may conclude that the blood is *viſcid*, and that the circulation of it through the minuteſt capillary ſanguine arteries into the veins is obſtructed, and too ſlow; in a manner ſimilar to that of cachectic patients.

§ 513. Hence it appears, that *ſaline* and *chalybeate* medicines are proper remedies for perſons under *chronical* diſeaſes attended with this ſymptom.

§ 514. For beſides removing the *viſcidity* of the animal fluids, we muſt in ſuch caſes endeavour to ſtrengthen the ſolids, &c.

END of LECTURE IV.

LECTURE V.

Of the morbid ſymptoms of the head; and thoſe attending reſpiration.

§ 515. THE third claſs of morbid ſymptoms comprehends thoſe of the HEAD; and the principal of theſe are the following, viz.

§ 516. 1. THIRST: this is that uneaſy ſenſation in the mouth and throat which makes the ſick perſon earneſtly deſirous of drinking liquors to remove it.

§ 517. Thirſt is a morbid ſymptom, when it is greater than in time of health; and occurs in moſt fevers, and likewiſe in ſome *chronical* diſtempers; and admits of a great variety of degrees.

§ 518. And in fevers it is commonly brought on by means of the febrile heat, which occaſions the thinner parts of the lymph to paſs through the emiſſary ducts ſituated in the *ſuperficies* of the mouth and throat; leaving the *ſaline particles*, at the extremities of the nerves affected, in a manner *dry* and *undiluted*.

§ 519. Hence they irritate the nerves, and excite that ſenſation we call *thirſt*.

§ 520. The curative indication leads us to direct ſuch *alterative* medicines as may abate the febrile heat, thin the blood, and occaſion a more copious ſeparation of *lymph* from it, and a greater flow of it to the mouth and throat; and likewiſe to direct ſuch diluting and attenuating drinks or liquors, and ſuch *gargariſms*, as may *diſſolve* and *waſh* away thoſe *ſaline* particles which brought on this ſymptom: proper *gargariſms* often give immediate relief.

§ 521. 2. A DELIRIUM, or *light-headedneſs.*

This is a threatening ſymptom, occurring in many different ſorts of fevers; but not in ſome, that are merely *putrid*, and from very diſſolvent cauſes.

§ 522. For many perſons have died, ſome of *putrid*, ſome of *peſtilential* fevers, and ſome of the ſmall-pox, attended with the *purples*, or *hæmorrhages*, who had no *delirium* through the courſe of their ſickneſs.

§ 523. A DELIRIUM is a great perturbation of the mind, occaſioned by a hot *intemperies* or *diſtemperature* of the *cerebrum* or greater brain; and is known to ſubſiſt when the patient talks irrationally, or does irrational actions; and when his words ſhew, that the ideas impreſſed on the common *ſenſory* are confuſed, or are falſe images of things; when the ſick expreſs apprehenſions of objects as being preſent, which are not preſent, &c.

§ 524. This ſymptom in the *ſmall-pox* is ſometimes brought on by PUSTULES formed on the *meninges* of the brain, which increaſe the heat of thoſe membranes, and of the brain ſubjacent.

§ 525. And in perſons under the *ſmall-pox*, if a *delirium* comes on in the period of eruption, and continues through the ſubſequent periods, we may reaſonably conclude, that puſtules are formed in thoſe membranes, the *dura* and the *pia mater*.

§ 526. It is very certain that *puſtules* frequently are formed on the *internal ſuperficies* of the body, as well as on the *external*.

§ 527. We ſee them on the *tongue*, and inſide of the cheeks, and lips, &c.

§ 528. And by the ſame cauſes they may be produced on the *ſuperficies* of the *æſophagus*, *ſtomach*, and *inteſtines*. I ſaw them on the *inteſtines* of a boy who died of that diſtemper.

§ 529. Theſe internal puſtules (§ 527, 528.) have a ſort of SUPPURATION. As for the *external* puſtules, the humid or aqueous parts of the variolous matter, contained in them, do evaporate through the pores of the *epidermis*, rendering it whiter and thicker, till the remainder becomes a dry incruſtation.

§ 530. But the *internal* PUSTULES can never ſcab, becauſe of the conſtant afflux of moiſture to them; but when they are fully ſuppurated, the little portions of membranes, which incloſed the *variolous matter*, become rotten, and fall off. I have ſeen an abundance of them in the ſtools of the ſick, &c.

§ 531. In other fevers a *delirium* is commonly produced by the extreme *heat* and *rarefaction* of the blood. And when this is the caſe, the *quickneſs* of the pulſe and *heat* of the body will ſhew it.

§ 532. Hence (§ 531.) it appears neceſſary to preſcribe ſuch *alterative* medicines and diluting liquors, as may abate the *heat* of the blood, the *celerity* of the pulſe, and the rarefaction of the animal fluids. Lemonade, &c. are often proper drinks.

§ 533. 3. WATCHFULNESS, or diſinclination to ſleep, is a morbid ſymptom frequently occurring, eſpecially in the *former* part of fevers.

§ 534. We muſt not only obſerve every ſymptom of the diſeaſe, but take particular notice of the time of the diſtemper in which each ſymptom happens. We ſhould conſider how many days the patient has been ſick when this or that ſymptom occurs.

§ 535. This ſymptom (§ 533.) ſeems to be produced by an extraordinary and continual flow of the nervous fluid from the *cerebrum*, or greater brain, into the organs of the ſenſes.

§ 536. And this continual flow of the *nervous* fluid into the organs of the ſenſes may, I apprehend, be rationally accounted for in this manner, viz. that in the former part of fevers, before the quantity of the blood is diminiſhed, the more frequent contractions of the heart occaſion larger quantities of blood to be carried every minute to the brain, than in a time of health; conſequently they muſt occaſion larger quantities of nervous fluid to be ſecreted by the brain. And theſe larger quantities muſt propel thoſe quantities of it, that were before ſecreted, onwards through the nerves to the ſeveral parts of the body to which thoſe nerves do paſs, and to all the organs of the ſenſes; and thereby keep the patient wakeful.

§ 537. It appears from what has been obſerved, that ſuch *alterative* medicines and diluting drinks, as will refrigerate and attenuate the blood, and abate the celerity of the pulſe, are the proper remedies for removing it: becauſe, if they take effect, the occaſions of the watchfulneſs will be removed.

§ 538. 4. IMMODERATE SLEEP is another morbid ſymptom that needs our conſideration: when ſuch a propenſity occurs, it is evident to the attendants on the ſick.

§ 539. When this propenſity terminates in profound ſleep, it is called *coma ſomnolentum*; and when it happens to a ſick perſon, if you rouſe him out of his ſleep, and put queſtions to him, he may anſwer you, but preſently falls profoundly aſleep again, and ſometimes with his mouth open, and his lower jaw fallen.

§ 540. But ſometimes there is a ſtrong propenſity to ſleep, when yet the patient cannot ſleep. This phyſicians call *coma vigil:* but the ſymptom under our preſent conſideration is that propenſity to ſleep which terminates in ſleep.

§ 541. And as *ſleep* is the ceſſation of all voluntary motions, and of thoſe influxes of the nervous fluid (ſecreted from the blood by the greater brain) into the organs of ſenſe, which are neceſſary to their eaſy and ready performing their proper offices; ſo ſleep muſt proceed from whatever cauſe doth hinder either the ſeparation of a ſufficient quantity of animal ſpirits or nervous fluid from the blood; or the influx of ſuch fluid into the organs of ſenſe, and other parts of the body, ſufficient for voluntary actions, and the exerciſe of the ſenſes.

§ 542. *Immoderate ſleep* therefore muſt reſult either, 1. From a great *deficiency* in the quantity of the nervous fluid, ſecreted by the greater brain; or, 2. From a compreſſion of the nervous *tubuli*, occaſioned by a *diſtention* of their next adjacent veſſels, which hinders the flowing, or the courſe of the nervous fluid through its proper *tubuli*.

§ 543. If the immoderate ſleep proceeds from a *deficiency* in the quantity of the nervous fluid ſecreted from the blood, it may be known to do ſo by preceding languors, by a general feebleneſs of the body, and a lowneſs of the pulſe; and in this caſe we ſhould direct a *nutritious* diet and cordials.

§ 544. If this ſymptom happens in the *beginning* of a ſickneſs, we may conclude, that it is produced by a *diſtention* of the veſſels next adjacent to the nerves, and ſhould direct thoſe medicines which may alter that morbid quality of the blood, which occaſioned that *diſtention* of the veſſels.

§ 545. 5. We proceed to conſider the morbid ſymptoms of the TONGUE: the tongue, which if it is of a natural redneſs, *clean*, and *moiſt*, is in a right ſtate, and is a good ſign. It ſhews that there is no great viſcidity in the blood, and no obſtructed circulation; but it often has morbid appearances.

§ 546. We find a TONGUE clean and moiſt in ſome threatening fevers of the *putrid* kind; and when we do, we may conclude, that the fever was produced by *diſſolvent* cauſes, and that the animal fluids are too thin.

§ 547. When it looks *white*, and has leſs moiſture than in time of health. This is the effect of a *viſcid* quality of the blood, which hinders that influx of the blood into the ſanguine *tubuli* ſituated in the ſuperficies of the tongue, which in the time of health makes it look red.

§ 548. When the tongue is in this ſtate, ſome *lymph* only and *not blood* is propelled into the ſanguine *tubuli*, that look white.

§ 549. This ſymptom therefore ſhews us, that we muſt endeavour to alter the *viſcid* quality that occaſioned it.

§ 550. When the TONGUE appears not only *white* but *furry*, as if there was a fur or down on its *ſuperficies:* this proceeds from the ſame cauſe that produced the laſt mentioned, and ſhews that the cauſe ſubſiſts in a greater degree.

§ 551. For that which appears like a *fur* or down is a multitude of emiſſary ducts, more empty of fluid than they were when only under the laſt ſymptom.

§ 552. When the TONGUE appears *dry* and *rough:* this immediately reſults from want of due ſupplies of fluid through the veſſels of it, and is the effect of a greater *viſcidity* in the animal fluids, and of a greater degree of *heat*, than what produced the foregoing ſymptoms; and therefore is more threatening.

§ 553. The conſideration of theſe things may convince us of the importance of ordering ſuch *alterative* medicines as may refrigerate the blood, reduce the vital heat to the ſtandard of health, and remove the *viſcid* quality of the animal fluids.

§ 554. When the TONGUE appears not only *dry* but alſo *black*, or *black* and *chapt* (in a manner ſimilar to the earth in ſummer, when the weather has been long dry and hot) it is a morbid ſymptom, produced at leaſt partly by *acrid*, *corroding* particles mixed with the blood, *partly* by exceſs of heat, and partly by *viſcidity* of the fluids.

§ 555. This ſymptom (§ 554.) diſcovers an *acrimonious*, *diſſolvent* quality in the blood, and ſhews that the fever depends on *complex* cauſes, &c.

§ 556. In thoſe extreme parts of the veſſels which appear black, there has been a *ſtagnation* of their contained fluids, and a *mortification* of the veſſels themſelves, ſo far as they appear black:

§ 557. And that they become *dry* proceeds partly from the heat of the ſubjacent parts, and partly from the *air* paſſing over them in reſpiration, cauſing the humid particles to evaporate with it.

§ 558. This is a very threatening ſymptom, and indicates the neceſſity of contriving and ordering ſuch *alterative* medicines as may render the blood and the other animal fluids thinner; and at the ſame time alter and remove the *acrimonious* and *diſſolvent* quality ſubſiſting in the blood.

§ 559. When *aphthæ* (§ 282.) appear on the tongue (or *gums*, or internal *ſuperficies* of the cheeks) it is a morbid ſymptom; whether the tongue is *moiſt* or *dry*.

§ 560. If the tongue that has *aphthæ* is *moiſt*, we may conclude, that there is a ſufficient quantity of lymph ſecreted from the blood, and that there is no great *viſcidity* in the animal fluids: but that there is ſo great an *acrimony* as puts the life of the patient in imminent danger.

§ 561. This ſymptom therefore ſhews the neceſſity of directing ſuch *alterative* medicines as may deſtroy the acrimony of the blood, &c. and bring the pulſe to the ſtandard of health, &c.

§ 562. It does not indicate an occaſion for bleeding or purging.

§ 563. If the tongue that has *aphthæ* appears *dry*, or to have very little moiſture, we may conclude that there is a *viſcidity* as well as an *acrimony* in the animal fluids.

§ 564. Thus we ſhould contrive ſuch remedies as may deſtroy both thoſe morbid qualities of the blood, which were combined in the production of the diſtemper, &c.

§ 565. Having thus diſtinctly conſidered the different appearances of the tongue in the time of ſickneſs, I ſhall proceed to treat on ſome other morbid ſymptoms appertaining to the head; and therefore obſerve,

§ 566. 6. That the LOSS OF SPEECH is a morbid ſymptom which ſometimes occur in fevers, and in other diſeaſes, eſpecially of the *paralytic* kind.

§ 567. I have met with it in different diſtempers, and it is always of a threatening nature.

§ 568. It is called *aphonia*, ſignifying a deprivation of the voice, or a loſs of the capacity of ſpeaking.

§ 569. It is produced by ſome impediment happening to the influx of nervous liquid into the muſcles of the tongue, and other muſcles neceſſarily acted in the modulation of the voice, and pronunciation of words: ſo that although all the parts uſed in ſpeaking are properly ſubjects of voluntary motions (which in the time of health move as the will determines), yet, when this ſymptom happens, although the patient wills to talk, yet he is not able to utter a word.

§ 570. This ſymptom may be occaſioned by an unuſual *diſtention* of the veſſels next adjacent to the nerves affected; which, by compreſſing them, may prevent the nervous fluid from flowing through them.

Or it may be brought on by a very *viſcid* quality of the blood, and a difficult circulation of it.

§ 571. When this ſymptom (§ 566.) happens in fevers, we muſt carefully conſider what were the cauſes which produced the fever, and what is the morbid ſtate of the animal fluids;

And preſcribe ſuch *alterative* medicines as may remove the morbid quality.

§ 572. As to the *proximate* cauſe of the loſs of ſpeech, we know it is ſome *obſtruction* to the courſe of the animal fluids through thoſe muſcles or parts which are neceſſarily acted in the pronunciation of words; and for removing the obſtruction I have found ſpirituous medicines very effectual, e. g.

℞ *Sp. lavendul. c. tinct. caſtor.* āā ʒiii. *et f.* MISTURA, *cujus capiat gut.* 10 *vel* 12. *ſubinde cum aliquantulo pulveris ſacchar. alb. miſtas.*

§ 573. Sometimes a bit of *bread* wetted with ſuch a mixture (§ 572.) held a little while in the mouth, and ſpit out, has been of great ſervice; *vel*,

℞ *Sp. roriſmarin.* ℥ſs. *tinct. ſuccin.* ℥ſs. *et f.* MISTURA *ut prior applicanda.*

§ 574. If there is reaſon to apprehend that the veſſels in the parts affected are diſtended with *viſcid* fluids, ſuch a foment as the following may prove beneficial.

℞ *Gum. ammoniac* ʒii. *acet.* ℔ſs. *m. pro* FOTU, *quo gula, et fauces tepidè foveantur.*

§ 575. 7.) HOARSENESS is another morbid ſymptom which reſults from a DRYNESS, and a conſequent *roughneſs* of thoſe muſcles uſed in modulating the voice; and ſhews a *viſcid* quality in the blood, as it is produced by it and the febrile heat, &c.

§ 576. 8. SORENESS of the THROAT is another morbid ſymptom, produced by ſome *acrimonious* humour ſecreted from the blood by the glands ſituated in the throat, which *incides* and ſeparates the *defenſative* mucus from the membranes where the ſenſe of the ſoreneſs ariſes; and indicates the uſe of *mucilaginous gargariſms*, *linctus's*, &c.

§ 577. 9. A DIFFICULTY of SWALLOWING is another morbid ſymptom, which frequently happens.

§ 578. This (§ 577.) may be produced two ways, viz. 1. By a tumour, or ſwelling of the muſcles that compoſe the *pharynx*, which is the head of the *œſophagus*; and of the parts adjacent.

§ 579. This (§ 578.) is the moſt frequent cauſe; and we may know whether it produces the ſymptom by looking into the mouth of the patient, which then will appear tumified, and more or leſs inflamed, as in quinſeys.

§ 580. If the difficulty of ſwallowing proceeds from a ſwelling of the parts affected, which has but newly happened, we ſhould endeavour to *attenuate* and *diſcuſs* the humours which make the tumour.

§ 581. This may be accomplifhed by proper gargariſms, ſuch as the following:

℞ *Sal. prunell.* ʒſs. *aq. alexit. ſimpl. vel. aq. pur.* ℥iii. *aceti*, *ſyr. bacc. ſambuc.* ā ā ℥iſs. *m. f.* GARGARISMUS *frequenter utendus*; *vel*,

℞ *Gum. ammoniac.* ʒſs. *aceti* ℥vi. *m. pro* FOTU, *quo gula et partes adjacentes tepidè foveantur.*

§ 582. If the parts tumified are in a ſtate of ſuppuration, as we have reaſon to think if they have been attended with throbbing pains, we muſt treat them as we do any external tumour in the like ſtate;

And direct ſuch things as theſe:

℞ *Mucilag. rad. althææ* ℥v. *ſyr. de althæa* ℥i. *m. f.* GARGARISMUS *tepidè utendus.*

§ 583. This ſymptom often happens in the ſmall-pox, &c.

§ 584. But, 2. A difficulty of ſwallowing ſometimes is brought on by a different cauſe, viz. a *ſpaſmodic* ſtate of the muſcles of the *pharynx*, when any effort for deglutition throws them into convulſive contractions, as in the *hydrophobia.*

And this alſo happens in divers nervous diſtempers.

§ 585. We may conclude this (§ 584.) to be the caſe, when, on looking into the mouth, we find that the throat is not ſwelled.

§ 586. A different method and different remedies are needful for removing this ſymptom.

§ 587. I would preſcribe ſuch a mixture as the following, viz.

℞ *Sp. lavendul. c.* ʒiſs. *tinct. ſuccini* ʒſs. *f.* MISTURA *cujus guttæ aliquot cum ſaccharo miſtæ ſumantur, ſubinde ut opus fuerit*; *vel,*

℞ *Sp. lavendul. c. tinct. caſtor.* āā ʒii. *et f.* MISTURA *cujus capiat gut.* 20 *vel* 30 *in* ℥iv. *Pſeudo thæ cum ſalvia pptæ. vel,*

℞ *Aceti vini albi* ℥iii.
Aquæ fluvialis ℥ii.
Succi rutæ recentis ℥i. *m. pro* GARGARISMO *tepidè utendo.*

§ 588. 10. Deafness is another morbid ſymptom often occurring in the progreſs of ſome fevers, and is frequently produced, 1. By the febrile heat ſtraitening the fibres, and occaſioning the auditory nerves to contract, leſſening the *diameter* of thoſe minute *tubuli*, and hindering thoſe impreſſions by the air on the common ſenſory, which ſounds uſually make; 2. By humours diſcharged.

§ 589. The *deafneſs*, which happens in the progreſs of fevers, often goes off ſpontaneouſly, when the febrile heat ſinks to the ſtandard of health, and the quantity of the *lymph* is recovered to the healthy ſtandard; and tranſmitted to the muſcular fibres and animal veſſels as in the time of health.

§ 590. But when this ſymptom ſubſiſts, the filling the cavity of the ears with warm water two or three times a day, is a rational medicine; and has been often effectual in caſes where I have adviſed it.

§ 591. II. A NOISE in the EARS is a morbid ſymptom of the head, which happens ſometimes in fevers, ſometimes in other diſtempers, and ſometimes it is the only diſorder which the perſon complains of.

§ 592. This ſymptom (§ 591.) is produced by *air* pent up in the *tympanum* of the ear (commonly by ſome obſtruction in the *tubæ Euſtachianæ)* and rarified by the heat of the adjacent parts.

§ 593. The *tubæ Euſtachianæ* are certain pipes or ducts (diſcovered by *Euſtachius)* which paſs from the inner cavity of the ear through the cheeks (partly *bony*, partly *cartilaginous)* and terminate in the mouth, with open orifices towards the palate.

§ 594. Through theſe paſſages (§ 593.) the external air paſſes to and from the inner cavity of the ear; whether drawn in through the noſtrils or mouth.

§ 595. This way *ſounds* are conveyed to the auditory nerves; which is the reaſon why *deaf* people hear better when they gape, or keep their mouths open.

§ 596. This ſymptom is cured by thoſe methods which remove obſtructions from the *tubæ Euſtachianæ*, and procure a vent for the air incloſed and rarified in the inner cavity of the ears.

§ 597. Detergent and deobſtruent *gargariſms*, and the ſnuffling emollient liquors up the noſtrils, and the ſteam of them received into the mouth, are proper remedies.

§ 598. 12. PAIN in the EARS ſometimes happens to perſons under fevers; and ſometimes when they have no other complaint.

§ 599. When this ſymptom happens to perſons under the ſmall-pox, it may reſult from *variolous* puſtules formed in the external cavity of the ears; and then may be relieved by ſuch emollient applications as promote their ſuppuration.

§ 600. This ſymptom likewiſe is produced by other humours in thoſe parts, which are the ſeat of the pain; and there excite the uneaſy ſenſations on the nerves affected.

§ 601. When this (§ 600.) is the caſe, thoſe remedies which attenuate and diſcuſs the obſtructed humours ſhould be adviſed.

§ 602. A patient of mine, viz. a girl of about ſix years old, in the fifth day of her decumbiture under the ſmall-pox, was ſeized with a moſt violent pain in her ears.

§ 603. I preſcribed for her the following remedy, which immediately abated her pain, and very ſoon removed it.

℞ *Croci Angl.* gr. xii.

Camphor. pulv. gr. vi. *ponantur in uvam paſſulam inciſam, quæ deinde torreatur igne. Tum fiat cum panno linteo* NODULUS, *lacte calido madefaciendus, à quo guttæ aliquot tepidè in aures inſtillentur.*

§ 604. 13. An HÆMORRHAGE, OF BLEEDING AT THE NOSE, is a morbid ſymptom of the head, which frequently happens; and is produced either, 1. By a violently ſtrong circulation of the blood in a plethoric body; or, 2. By an extraordinary *rarefaction* of it; or, 3. By *diſſolvent* particles mixed with it.

§ 605. If this bleeding at the noſe proceeds from a violently ſtrong circulation of the blood in a *plethoric* body, which burſts the tender coats of the ſanguine veins ſituated in the noſtrils, the ſigns of a *plethora*, or of an exceſs in the quantity of the blood preceded.

§ 606. When this (§ 605.) is the caſe, we may expect ſome advantage to the ſick from the *hæmorrhage*, if it *be not too great*; and we ought not to ſtop it, unleſs it exceeds; and if the blood diſcharged by the hæmorrhage be not ſufficient to take off the exceſs of its quantity, we ought to adviſe bleeding.

§ 607. Indeed we may conclude this hæmorrhage to be exceſſive, if the pulſe ſinks below the ſtandard of health; if it makes an abatement of the vital ſtrength, and renders the patient faint.

§ 608. When it is needful to ſtop this hæmorrhage, common *aſtringents* and *ſtyptics* may anſwer the occaſion; or ſnuffing up ſome *ſp. vini rect.* and wetting the outſide of the noſe with the ſame.

§ 609. But if theſe ſhould fail, DOSSILS armed with ſome gentle *cauſtick* may be put up the bleeding noſtril.

§ 610. Cauſticks for this purpoſe may be made in the following manner, viz.

℞ *Calcis vivæ, boli armeniæ, aluminis petræi ſingulorum* ℈ii. *m. f.* PULVIS *ſubtiliſſimus de quo aliquantillum ope turandarum naribus indendum*; *vel,*

℞ *Boli armen. vitriol. rom.* ā ā ʒi. *m. f.* PULVIS *ſubtilis, eodem modo utendus.*

§ 611. I once had a young man for my patient, who was frequently taken with bleeding at his noſe; for whom I found it neceſſary to direct a *cauſtick* powder, to be applied in the manner mentioned, and with happy ſucceſs.

§ 612. His hæmorrhage indeed proceeded from a diſſolvent, ſcorbutic quality of his blood. But if a bleeding at the noſe be the effect of any other cauſe, yet the ſame external remedies are proper; the intention of them being to contract the orifices through which the blood flows out of the veins, and thereby to ſtop the flux of it.

§ 613. But 2dly, This hæmorrhage (§ 604.) is ſometimes produced by an extraordinary *rarefaction* of the blood: and we may conclude, that it was ſo produced, if there were no preceding ſigns of an exceſs in the quantity of the blood; and if there are *no* ſymptoms diſcovering a *diſſolvent* quality ſubſiſting in it; and if the febrile heat be very great, and the pulſe very full and ſtrong.

§ 614. When the hæmorrhage is produced by the cauſe laſt mentioned, thoſe refrigerating *alterants* ſhould be preſcribed, which may leſſen the heat of the blood and the celerity of the pulſe, and take off the benefaction of the fluids: proper external applications ſhould be made to ſtop the bleeding.

§ 615. And 3dly, This bleeding at the noſein acute fevers ſometimes is produced by *diſſolvent* cauſes, which render the conſiſtence of the blood too thin, and divides the red globules into leſs; and at the ſame time relax the coats both of the ſanguine and lymphatic veſſels.

§ 616. And in this ſtate of things we ſhould conſider that the diameter of the parts of the broken globules muſt be proportionably leſs than the diameter of the globules before they were broken, or divided; and likewiſe that the diameter of the cavity of the veſſels rendered *lax*, will be eaſily enlarged.

§ 617. And hence we may apprehend how it comes to paſs, that in putrid fevers, from *diſſolvent* cauſes, blood runs out of the body by ſuch unnatural and unuſual ways.

§ 618. Farther, This ſymptom may proceed from thoſe acrid particles which *corrode* the membranes of the ſanguine veſſels, through which the hæmorrhage happens.

§ 619. We may know that this ſymptom proceeds from one or other of the two laſt cauſes, (§ 615, 618.) when there have been no ſigns of an exceſs in the quantity of the blood; and that there are no ſigns of a *rarefaction* of it; but that the pulſe is *quick* and *weak*, and the heat of the fleſh very moderate.

§ 620. The hæmorrhage in this caſe is a very threatening ſymptom, and ſhews that there is very little ground to expect the patient's recovery: it diſcovers an alteration of *that* conſiſtence of the blood, and of that conſtructure of its conſtituent parts, which is neceſſary to the life of the body.

§ 621. It is neceſſary, therefore, when a patient is in ſuch a deplorable ſtate, to preſcribe thoſe *alterative* medicines which are moſt likely to remove the *diſſolvent* quality from the animal fluids, and to ſtop the *putrefaction* of the blood, and increaſe the force of coheſion between the component parts of the muſcular fibres and animal veſſels.

§ 622. For this purpoſe *ol. vitriol. ſp. vitriol.* and other acids are proper; and likewiſe the *balſamum reſtringens*, deſcribed in my book on the ſmall-pox. Vid. an example of this Lib. de Variolis, p. 237, &c.

§ 623. IV. The fourth claſs of morbid ſymptoms comprehends thoſe which happen in the RESPIRATION, or BREATHING.

§ 624. We ſhould take particular notice of the patient's BREATHING; becauſe the ſtate of it will lead us into the KNOWLEDGE of divers things which may enable us to preſcribe for the ſick with greater propriety.

The principal ſymptoms of this claſs are the following, viz.

§ 625. 1. An *eaſy* RESPIRATION in fevers (like one in health, except in ſome *putrid* fevers) ſhews, that all the organs, ſubſerving this office in the animal œconomy, are in a hopeful condition.

§ 626. It ſhews that the *lungs*, *heart*, *diaphragm*, *pleura*, the *muſcles* of the *breaſt*, *ribs*, and *abdomen*, are eaſily contracted and dilated: it alſo ſignifies, that the blood is in a tolerable ſtate of fluidity, and that there is no conſiderable *viſcidity* in it, nor particles too bulky to paſs through the capillary arteries; and therefore allows us a pleaſing hope of the patient's recovery.

§ 627. This ſymptom is a very favourable one in *ardent* and inflammatory fevers; but in thoſe of the *putrid* kind, attended with great thirſt, a *dry* and *black* tongue, and with frequent *ſighing*, and a ſudden and great loſs of ſtrength, we muſt not build much hope upon it; but rather infer from it, that the fever was produced by *diſſolvent* cauſes, and is attended with great danger.

§ 628. When we find an eaſy reſpiration in perſons under *putrid* fevers, we ſhould direct ſuch *alterative* medicines as may take off the *diſſolvent* quality from the blood, and alter the figure of any *acrid* or *corroſive* particles mixed with it.

§ 629. 2. An *uneaſy* or painful RESPIRATION is another ſymptom to be conſidered. This frequently happens in divers ſorts of fevers, eſpecially in thoſe of the inflammatory kind.

§ 630. It (§ 629.) diſcovers, that there is a *viſcidity* in the blood, or particles mixed with it *too bulky* to paſs eaſily through all the minute veſſels.

§ 631. If the pain is *violent*, *acute*, and *permanent*, it ſhews that thoſe parts, which are the ſeat of the pain, are *inflamed*; and, by conſidering the ſituation of the pain, we learn what are the parts inflamed. Thus, in *pleuritic* fevers, we know by the ſeat of the pain which part of the *pleura* is inflamed; whether that on the right or the left ſide, &c.

§ 632. This ſymptom ſhews the life of the patient to be in a great deal of danger; and that it is of the utmoſt importance to preſcribe thoſe *alterative* medicines which may quickly attenuate the animal fluids, and remove the morbid quality ſubſiſting in them, and thereby the inflammation dependant on it.

§ 633. 3. The *large* RESPIRATION in fevers deſerves our notice; that is, when the quantity of air paſſing into the lungs, at every inſpiration, is larger than in the time of health.

§ 634. This proceeds from a greater expanſion of the lungs, and of the air veſicles in them, than is uſual in time of health; and ſhews, that there is a plenty of lymph ſecreted from the blood; that the blood is not *viſcid*, and that the muſcular fibres and veſſels are not *rigid:* it likewiſe ſhews that the veſſels are eaſily and duly extended, and contracted *alternately*; and that there is a free courſe of their fluids through them: this is a good ſign, but rarely happens in fevers.

§ 635. 4. The *little* RESPIRATION (that is, when a leſs quantity of air paſſes into the lungs at every inſpiration, than in the time of health) ſhews that the ſubſtance of the lungs, and the air veſicles in them, are not ſo diſtractile nor contractile as in the time of health.

§ 636. This ſymptom, therefore, muſt reſult either, 1. From a *diſtention* of the ſanguine veſſels of the lungs by a *viſcid* blood, paſſing too ſlowly through them.

§ 637. Or, 2. A dry intemperies of the membranes of the lungs.

§ 638. When it (§ 635.) reſults from a viſcid quality of the blood, there are other ſigns of ſuch a quality ſubſiſting.

§ 639. And when this is the caſe, ſuch *alterative* medicines muſt be directed, as may deſtroy that quality.

§ 640. The dry *intemperies* of the membranes of the lungs renders them leſs diſtractile than they ſhould be, in order to admit of the paſſage of a proper quantity of blood through them.

§ 641. We have reaſon to conclude that this is the caſe, if, examining the patient, we find there are ſigns of a *rigidity* of the muſcular fibres and veſſels; and of a deficiency in the quantity of the *lymphatic* fluid.

§ 642. The conſideration of theſe things will teach us (when the ſymptom is produced by the cauſe laſt mentioned) to preſcribe ſuch remedies as may take off the *rigidity* of the veſſels, attenuate, dilute, and thin the blood; and augment the ſecretion of lymph from it, &c.

§ 643. But, 3. This ſymptom may be brought on by a *viſcid* phlegm, excreted by *lymphatic* arteries, and in ſome meaſure filling the *cavity* of the air-veſicles; and thereby rendering them incapable of receiving ſuch a quantity of air as uſed to paſs into the lungs at every inſpiration in the time of health.

§ 644. When this (§ 643.) is the caſe, it may be known partly by the temperature of the fleſh, that being more moderate; partly by the ſigns which ſhew that the veſſels are rather *lax* than *rigid*; and partly by the abatement of the ſymptom, when the patient has a free expectoration.

§ 645. And thoſe things which may remove a *viſcid* quality from the animal fluids, and at the ſame time promote evacuation by *ſpitting*, by *urine*, or *inſenſible* perſpiration, are the proper remedies, &c.

§ 646. But, 4. The *little* reſpiration may be brought on by any other matter lodged in the air-veſicles, and in a meaſure filling their cavity.

Whether the ſubſtance lodged in them be of a *ſcirrhous* nature, or any other.

§ 647. In this caſe (§ 646.) which I eſteem a deplorable one, the little reſpiration uſually remains the ſame, &c.

§ 648. But, 5. This ſymptom (§ 635.) may be occaſioned by ſome tumour, or other matter, obſtructing, or in part filling the *aſpera arteria*. Whence it happens, that leſs air paſſes through it into the lungs, than in time of health.

§ 649. We have reaſon to apprehend this to be the caſe, when on examining the patient we find no ſymptom of its being produced by any of the other cauſes mentioned.

§ 650. And the cure can be accompliſhed *only* by ſuch methods and medicines as are proper to remove the matter obſtructing in the *aſpera arteria*; and theſe muſt be choſen out of that claſs which have a *diſſolvent* quality, &c.

§ 651. 5. The *ſlow* RESPIRATION. I call that a *ſlow* reſpiration, which is not ſo quick as in time of health.

§ 652. This ſometimes, but very rarely, happens in fevers; and when we meet with it (except in *putrid* fevers) we may look on it as a good ſign, encouraging us to hope for the patient's recovery: and it ſignifies much the ſame as the *large* reſpiration, which has been diſcourſed on, (§ 633.)

§ 653. 6. The *quick* RESPIRATION in diſeaſes needs our conſideration.

I call that a *quick* reſpiration, which is *quicker* than in the time of health; and there are various *degrees* of quickneſs: but the quicker the reſpiration of the patient is, ſo much the greater is his danger.

§ 654. This ſymptom ariſes from more frequent expanſions and contractions of the lungs, and of thoſe muſcles which ſubſerve the reſpiration.

§ 655. And the frequency of their action is occaſioned by obſtructions of the lungs. And thoſe obſtructions may be produced by a *ſpiſſitude* of the blood, as in *ardent* fevers; or by a certain degree of *viſcidity* of it, as in *inflammatory* fevers.

§ 656. And therefore to relieve a patient under this ſymptom, which is very threatening, we muſt order thoſe *diſſolvent* MEDICINES which may attenuate the animal fluids, render them thinner, and abate the febrile heat, e. g.

℞ *Sal. nitri* ʒi. *aq. alexiter. ſimpl.* ℥v. *aq. alexiter. ſpirituoſ.* ℥i. *ſp. nitri dulcis* ʒi. *ſacchar. albi, q. ſ. ad ſaporem gratum m. f. julepum cujus capiat cochl.* ii. *omni bihorio tepide ſuperbibendo hauſtum decocti Hord*; *vel,*

℞ *Gum ammoniac.* ℈ſs. *ſal. prunell.* ʒſs. *diſſolvantur in aq. pulegii ſimpl.* ℥v. *dein adde aq. ſulphur. et aq. pulegii ſpirituoſæ* ā ā ℥ſs. *ſacchar. alb. q. ſ. ad gratum ſaporem m. f. julepum ut prius ſumendum*; *vel,*

℞ *Aq. fluvialis* ℔ſs. *ſp. nitri dulcis* ʒi. *ſacchar. albi, q. ſ. ad gratam dulcedinem. m. f. potus attenuans, cujus tepidè bibat cochl.* iv. *trihoriis, vel ſæpius, ſi fuerit opus, durante ſymptomate.*

§ 657. 7. The *equal* RESPIRATION, and moderate as to quickneſs, is an hopeful ſign; ſhewing that the blood and organs of reſpiration are in ſo favourable a ſtate as to encourage our expectation of the patient's recovery.

§ 658. 8. The *unequal* RESPIRATION; that is, when the diſtances between the reſpirations are unequal; ſometimes longer, and ſometimes ſhorter: this is a morbid ſymptom of a ſignification contrary to that laſt mentioned.

§ 659. This ſhews an obſtructed circulation from an *unequal viſcidity* of the blood, and from *unequal influxes* of nervous fluid into the organs of reſpiration; and diſcovers to us that the recovery of the ſick is very doubtful.

§ 660. Hence (§ 659.) we may infer the neceſſity of preſcribing ſuch *alterative* medicines as may attenuate the animal fluids, diſſolve any viſcid coheſion, and render the circulation of the blood through its veſſels free and eaſy.

§ 661. 9. The *difficult* or *laborious* RESPIRATION in fevers demands our attention.

§ 662. It proceeds from the ſame cauſes which produced the laſt ſymptom (§ 658, 659.) when they ſubſiſt in a greater degree.

§ 663. It diſcovers the lungs to be much more obſtructed, and that they are not capable of due and regular expanſions and contractions; and that the blood is ſo exceeding *viſcid*, as to be incapable of paſſing freely through the capillary veſſels.

§ 664. When this ſymptom occurs in acute diſeaſes, death commonly is very near.

§ 665. The ſtrongeſt and quickeſt diſſolvents are the proper remedies in this deplorable caſe: ſuch as will incide and attenuate *viſcid* phlegm, raiſe a cough, and promote expectoration.

§ 666. This ſymptom ſometimes happens in *hyſteric*, *hypochondriac*, and *aſthmatic* people: they have a laborious and ſometimes a ſort of ſuffocative reſpiration; but it proceeds from a *ſpaſmodic* cauſe, and is not ſo threatening.

§ 667. When this ſort of breathing happens in chronical diſtempers, *refrigerating* or *ſaline* DISSOLVENTS are generally the moſt effectual remedies.

END of LECTURE V.

LECTURE VI.

In which the ſymptoms in the urine of ſick people are conſidered.

§ 668. V. THE fifth claſs of ſymptoms comprehends thoſe which happen in the URINE of ſick people; and, for the better underſtanding the *various* appearances in urines, I would obſerve a few things, viz.

§ 669. Obſ. 1. That by the excreting *tubuli* of the kidneys any ſort of particles may paſs off from the blood, that are minute enough to be excreted through them.

§ 670. Obſ. 2. That the blood, by the new chyle, is continually ſupplied with *terrene* or earthy, *ſaline*, *pinguedinous*, *oleaginous* particles; and with many other ſorts whoſe texture, figure, and qualities we know not, &c.

§ 671. Obſ. 3. That conſiderable quantities of a *watery* fluid (which is a great part of the *chyle*) are daily conveyed into the blood.

§ 672. Obſ. 4. That particles of the *ſolids*, that is, of the ſanguine and lymphatic veſſels, &c. are daily rubbed or waſhed off by, and mixed with, the current of the fluids continually flowing thro' them.

§ 673. Obſ. 5. That many of the component parts of the blood are continually decaying: that is, declining from that figuration and coheſion which are neceſſary for the uſes of the body; and thus become *effete* and ſuperfluous.

§ 674. The different figures of the different ſorts of ſuperfluous and excrementious particles, ſeparated from the blood by the excretory tubuli of the kidneys, give thoſe different colours and appearances which are obſerved in urine.

§ 675. The urine of perſons in health, who live temperately, is *clear*; of an *amber* or *citrine* colour, or of the colour of *canary wine*; ſometimes having a cloud hanging in it. And in our climate the quantity of it commonly amounts in the ſpace of twenty-four hours, at leaſt to half the quantity of the aliments taken into the ſtomach in the ſame ſpace of time.

§ 676. I aſſign, at leaſt, half the quantity of the aliments taken into the ſtomach, as the *mean quantity* of urine evacuated in a natural day; becauſe Dr. Keil, by ſtatical experiments, found it to be ſo in our country; whoſe computation therefore ſhould be allowed as right.

§ 677. We may, from what has been obſerved, pretty eaſily underſtand how VARIATIONS from the healthy ſtandard may happen in urine; particularly, 1. That if any cauſe hinders the excreting of the *terrene*, *ſaline*, and other ſuperfluous and excrementitious particles through the kidneys, the urine muſt be *thin* and *colourleſs*; and void both of ſmell and taſte, and look like common water.

§ 678. 2. That if *terrene*, *ſaline* and other ſuperfluous and excrementitious particles are excreted by the kidneys in greater quantities than in the time of health, the urine muſt be proportionally *more* coloured.

§ 679. 3. That if, by an *attrition* of the component parts of the blood greater than in the time of health (as in ſome fevers) or, if by any *diſſolvent* cauſes, the *red* GLOBULES of the blood ſhould be broken into leſſer, or particles of them be broken off, and come off with the urine, they muſt give a colour to it, according to the ſize of the parts of the comminuted globules, and in proportion to the quantity of them, which is excreted with the urine.

§ 680. Hence we may infer, 1. That as the red globules, when only a little broken, loſe but a little of their natural colour, ſo if, through a *laxity* of the excretory *tubuli* of the kidneys, the comminuted globules paſs through them; or if, by means of a *corroding quality* of the blood, the coats of the capillary ſanguine veſſels are eaten through, and the globules fall into the *pelvis* of the kidneys, and through the ureters into the bladder, they make what we call a *bloody* urine: but this does not happen when the febrile heat is intenſe.

§ 681. 2. That as the globules of the blood, if they are more broken, become leſs dark, and *more red*, ſo when they come away from the kidneys with the urine, they render it high coloured in proportion to the quantity of this ſort of particles mixed with it: and a much greater *variety* of colours, than theſe I have mentioned, may be produced in urines, according to the greater variety of degrees of comminution, which the red globules are capable of, and the greater proportion of the quantity of thoſe comminuted globules which may happen to be excreted with the urine.

§ 682. It muſt be obſerved, that the red globules may be broken and comminuted not only by a violent ATTRITION of them, as in *ardent* and *inflammatory* fevers, but likewiſe by diſſolvent particles ſubſiſting in the blood.

§ 683. Thus it is in *putrid* fevers produced by *diſſolvent* cauſes, &c.

§ 684. When we meet with high-coloured urines, and find the *febrile* HEAT very *great*, and the PULSE *quick*, and *ſtrong*, or *hard*, we may conclude that ſuch urine was produced by an extraordinary ATTRITION of the parts of the blood.

§ 685. But if we find the HEAT of the fleſh *moderate*, and the PULSE *weak*, we may be ſure that the high-coloured and the bloody urines were not produced by an extraordinary *attrition*, but by *diſſolvent* cauſes; and that the diſeaſe was brought on by a *diſſolvent* quality of the blood.

§ 686. I may add, that I never met with a *bloody* urine in fevers, reſulting from *inſpiſſating* cauſes; never ſaw an inſtance of it, where the *febrile heat* was very great, and the pulſe *quick* and *ſtrong*.

§ 687. We have indeed no reaſon to expect ſuch a urine, when we find no exceſs of heat with ſuch a pulſe (§ 686.); becauſe that exceſs of heat renders the blood thicker, and tends to hinder a bloody urine, and any other hæmorrhage.

§ 688. I have ſeveral times ſeen a bloody urine in variolous fevers, but always attended with a *weak* PULSE and moderate heat.

§ 689. If particles of *bile* happen to be mixed with the blood in a greater quantity than in time of health, and excreted with the urine, they make it appear as if it was tinctured with *ſaffron* more or leſs, according to the quantity of the particles of *bile*, which come off with the urine.

§ 690. This I call a *bilious urine*, which commonly reſults from obſtructions of the liver, and happens in ſome fevers, as it does in the jaundice, &c.

§ 691. I ſhall now conſider the principal *ſymptoms* occurring in the URINES of perſons under diſeaſes; particularly,

I. EXCESS in the quantity of the urine: that is, when the urine is more in quantity than in the time of health, in proportion to the quantity of liquids taken in: this is a ſymptom which deſerves your notice.

It ſhews either that there is a laxity of the excretory *tubuli* of the kidneys, &c.

Or a diminution of the diſcharges by the inſenſible perſpiration, &c.

Or, that there is not a due mixture of the *ſerum* with the *globular* parts of the blood.

§ 692. If we find thoſe ſigns which diſcover that the veſſels are *lax*, we muſt direct ſuch medicines as may ſtrengthen the ſolids, and increaſe the force of coheſion between their conſtituent parts.

§ 693. If we have ground to apprehend that the quantity perſpired is leſs than it ought to be, we muſt direct thoſe *alterative* medicines which may attenuate the animal fluids, and *increaſe* the evacuation by inſenſible perſpiration, and promote a due mixture of the component parts of the blood.

§ 694. II. A DEFICIENCY in the quantity of the urine (that is, when the quantity of it is leſs than in the time of health, in proportion to the quantity of the liquids drank.) This is a ſymptom we ſhould underſtand.

§ 695. It ſhews either, 1. That the excretory *tubuli* of the kidneys are obſtructed by *viſcid* humours, and that the blood is ſo very *viſcid*, that the uſual quantity of water cannot be ſeparated from it.

Or, 2. That the excretory *tubuli* of the kidneys are under a *ſpaſmodic* contraction.

Or, 3. That the diſcharge by the inſenſible perſpiration has been greater than in time of health;

Or, 4. That ſuch have been evacuations by *ſweating*, or *ſpitting*, or *ſtool:* becauſe it could not happen unleſs one or other of the cauſes mentioned ſubſiſts.

§ 696. If it is produced by the *firſt cauſe* aſſigned (§ 695.), it foreſhews that there will be too great an increaſe of the quantity of fluids in the body; if the producing cauſe be not removed, or ſome other evacuation ſufficiently augmented.

§ 697. When this is the caſe, it may be known by the ſigns of a *viſcid* quality ſubſiſting in the blood: and we ſhould preſcribe *ſaline* ALTERANTS, which have a *diuretic* and *diſſolvent* quality, and may deſtroy the *viſcidity* of the *obſtructing* humours.

§ 698. If it is occaſioned by the *ſecond* cauſe, viz. a *ſpaſmodic* conſtruction of the *excreting tubuli* of the kidneys, it may be known to be ſo, by ſome viſible ſymptoms of other *nervous* diſorders afflicting the patient; which will lead us to order ſuch medicines as may remove the *ſpaſmodic* ſtate of the veſſels, and the conſtriction of the *urinary tubuli*, &c.

§ 699. If it is the effect of the *third cauſe* aſſigned, viz. an extraordinary diſcharge by inſenſible perſpiration, *ſaline alterants* may be ſufficient to remove it, &c.

§ 700. If it be the conſequence of the *fourth* and laſt cauſe ſpecified, viz. ſome other EVACUATION *augmented* beyond its uſual quantity; it will be proper to preſcribe *diuretic* ALTERANTS, to recover the natural evacuations to the order and proportion which they bear to one another in time of health.

§ 701. It appears, I apprehend, from what has been obſerved, that it is a point of moment to get the knowledge of the quantity of urine voided by the patient.

§ 702. And for this end (§ 701.) we may direct an account to be taken of the quantity of the *ingeſta* in twenty-four hours; and of the quantity of the urine voided in the ſame ſpace of time.

§ 703. III. Pale urine in diſeaſes is a ſymptom we ſhould conſider: I call that a *pale* urine, which is leſs coloured than in the time of health.

§ 704. And the *paleneſs* of urine admits of a great variety of *degrees*, till it comes to look like pure water.

§ 705. When we find the patient's *urine thin* and *pale*, looking like fair water, without *colour*, *taſte*, or *ſmell*, we may *conclude* that the *terrene*, *ſaline*, and other excrementitious particles, which ſhould have been evacuated from the blood thro' the kidneys, do remain in it.

§ 706. And in fevers we have reaſon to think that more threatening ſymptoms will ſoon appear, *produced by ſuch particles remaining in*, and circulating with the blood.

§ 707. It is evident to obſervation, that *deliriums*, or obſtructions, and divers ſorts of pains have in a little time followed the retention of thoſe humours in the blood, which ſhould have been carried off from it through the kidneys.

§ 708. Let us therefore inquire into the cauſe productive of this ſymptom (§ 703.) in *acute* diſtempers.

I apprehend that it is produced by one or other of theſe two following cauſes, ſingly or in combination, viz. 1. A conſtriction, or compreſſion of the excretory *tubuli* of the kidneys; or,

2. Such a tenacious union of the *terrene*, *ſaline*, *oleaginous*, and other excrementitious particles with the red globules, or with one another, as renders them *too bulky* to paſs through the excretory ducts of the kidneys.

§ 709. 1. As to the firſt of theſe cauſes, it is eaſy to apprehend, that the excreting *tubuli* of the kidneys may be conſtricted, or compreſſed, and the diameter of their cavities ſo much leſſened, that only the aqueous particles, or the pure water of the blood, ſhall be able to paſs through them.

§ 710. If thoſe *tubuli* were not conſtricted or compreſſed; if the diameter of their cavities remained the ſame, as in time of health; and if the *ſaline* and other excrementitious parts were incoherent, and minute enough to paſs through them, this ſymptom could not poſſibly happen.

§ 711. And therefore when it does happen, we may be ſure that one or other, or both the cauſes ſpecified, ſubſiſts to the production of it.

§ 712. If we find the heat of the body intenſe [whether that heat be *ſpontaneous*, reſulting from the primary cauſe of the diſtemper; or forced by an indiſcreet giving to the ſick ſpirituous liquors, or hot alexipharmicks, which we ſhould inquire into] we may reaſonably apprehend, that the excretory *tubuli* of the kidneys are under a conſtriction, or compreſſion.

§ 713. I may obſerve, that in the courſe of my practice, if the patient was not *delirious*, nor had the *pale* urine before I viſited him, it has been very rarely that I have met with a *pale* urine or delirium afterwards.

§ 714. Thoſe alterative medicines in ardent and inflammatory fevers, which deſtroy the morbid quality that produced them, and which abate the heat, and the undue force of the blood's motion, are generally effectual to procure a good colour in the urine, and remove a *delirium*; and are more effectual to prevent them, if they have not happened.

§ 715. 2. When there is ſo great a *ſpiſſitude*, or *viſcidity* of the blood, and ſuch an UNION of the *ſaline* and other excrementitious particles with the *red* globules, or with one another, as renders them unpaſſable through the excretory ducts of the kidneys; it may be known by other concomitant ſymptoms: it may be known by ſigns ſhewing either too great a thickneſs of the blood, or ſigns of a *viſcid* quality ſubſiſting in it; which ſigns have been already treated of.

§ 716. And in this caſe alſo we are to preſcribe ſuch *alterative* medicines as will *thin* the blood, and remove the morbid qualities ſubſiſting in it; and as will render all ſuperfluous and excrementitious particles *incoherent* and *minute* enough to paſs off with the waters of the urine. But,

§ 717. 3. The *pale urine* may be produced *partly* by a conſtruction or compreſſion of the excretory *tubuli* of the kidneys, and partly by a *ſpiſſid* or *viſcid* blood.

§ 718. When this (§ 717.) is the caſe, the medicines ſhould be ſo contrived as to remove the *combined* cauſes.

§ 719. When a *pale* urine occurs in fevers produced by *inſpiſſating* cauſes, we may eaſily apprehend that the inſpiſſated blood *may diſtend* the capillary ſanguine arteries, and that the *diſtention* may *compreſs* the adjacent nerves, and leſſen the diameter of the adjacent *excretory* veſſels, and occaſion a *pale* urine, &c.

§ 720. But a *pale* urine often happens in ſome *chronical* diſeaſes, eſpecially thoſe of the *hyſterical* and *hypochondriacal* kinds; and frequently on ſudden ſurprizes, ruffling and grieving incidents.

§ 721. And frequently great perturbations of the mind are followed with a *pale* urine.

§ 722. I apprehend that in theſe caſes, the force of the action of the heart and arteries is abated; the motion of the blood through its veſſels is ſuddenly rendered *too ſlow*; the *capillary ſanguine arteries* become diſtended, and thereby the excretory *tubuli* of the kidneys are ſuddenly *compreſſed*: the diameter of their cavities ſo leſſen'd, that only the water of the blood can paſs through them.

§ 723. And in ſuch caſes (§ 720.) thoſe *cordial* or *reſtorative* medicines, which recover the ſtrength of the action of the heart, and exhilarate the ſpirits, are the proper, and like to be the effectual remedies.

§ 724. As to fevers, it muſt be noted, that if this *pale* and *thin* URINE happens in the beginning of them, it ſhews a great deal of danger; and if it continues, it ſhews the danger ſtill to be greater. But it is ſtill a more threatening ſign, if, about the height of the diſeaſe, the urine from a *reddiſh* or *high* colour gradually changes to be *thin* and *pale:* and I muſt here obſerve, that *refrigerant*, *diſſolvent* ALTERANTS appear abſolutely neceſſary on ſuch occaſions; and that between whiles ſome proper cordials ſhould be given.

§ 725. I do not remember that ever I have met with this ſymptom in any fever produced merely by *diſſolvent* cauſes. In *putrid* fevers the urine generally is deep-coloured, &c.

§ 726. IV. The *high-coloured* URINE, *clear*, and WITHOUT SEDIMENT, though it ſtands in a cold place a ſufficient time for dropping one, is another ſymptom in diſeaſes to be conſidered.

§ 727. I call that a *high-coloured* URINE, which is of a higher colour than in the time of health. And there is a vaſt variety of degrees, as to the increaſe of colour from the *Canary* or healthy colour, to that of blood.

§ 728. I muſt obſerve, that the colour of urine may in various degrees increaſe, both in fevers from inſpiſſating, and in thoſe produced by diſſolvent cauſes.

§ 729. Let us conſider this ſymptom as occurring in both theſe ſorts of fevers.

And, 1. When it happens in fevers reſulting from *inſpiſſating* cauſes. If in a patient under a fever we find his PULSE *quick* and *ſtrong*, and the febrile heat intenſe, we ſhould conclude that it was produced by *inſpiſſating* cauſes.

§ 730. And thereby we know that there has been a much greater ATTRITION both of the *ſolids* and *fluids*, than in the time of health.

§ 731. For the ſtronger and more frequent contractions of the heart, in theſe fevers, impel the blood with greater force againſt the ſides of thoſe ſanguine veſſels; and in like manner the ſtronger and quicker contractions of the ſanguine arteries impel the parts of the blood (as they glide along their ſides) with greater force towards their *axis*.

§ 732. And by means of this greater *attrition*, many of the component parts of the red globules will be broken off, and come away with the urine, and likewiſe many of thoſe broken and ſeparated parts, or particles, may become *acrid*.

§ 733. Dr. BOERHAAVE's experiments with *quickſilver* prove, that mere *friction* (if ſufficiently continued) can make ſmooth globular particles to have acute angles, and become acrid.

§ 734. His two firſt *collaries* from his firſt experiment with *quickſilver* are theſe, viz. 1. *Argentum vivum, inſipidiſſimum, ex ſe, ſolo quaſſatu, fit ſaporis metallici æneі.*

2. *De mitiſſimo fit acre, penetrabile*, ſee in the *Philoſophical Tranſactions*, N° 430. p. 150.

§ 735. Another effect of the greater *attrition* in ſuch fevers is a rubbing off, and ſeparating many particles of the ſanguine *veſſels* by the greater *impetus* of the motion of the blood againſt them; which ſeparated particles come away with the urine.

§ 736. The increaſed force of the action of the heart and arteries, and the augmented motion of the blood, may likewiſe produce a more *intimate mixture*, *union*, and *coheſion* of the *terrene*, *ſaline*, *oleagenous* and other particles (circulating through the ſanguine veſſels) *with the* aqueous parts of the blood, and occaſion their coming away with the urine in greater quantities.

§ 737. And therefore the higher the colour of the urine is, we may the more certainly infer, that the greater has been the *attrition* of the component parts both of the *ſolids* and *fluids*. This is a rational concluſion from the *greater* quantity of thoſe particles evacuated with the water of the urine, which render the colour higher.

§ 738. And we may eaſily apprehend, that the reaſon why this ſort of urine drops *no* ſediment, is becauſe thoſe particles, which give the high colour to the urine, are ſo cloſely united, and cohere ſo ſtrongly with the aqueous parts of it, that they cannot run together, and form corpuſcles of a greater gravity than that of the water of the urine, &c.

§ 739. This ſort of urine therefore diſcovers the neceſſity of preſcribing ſuch alterative medicines as may reduce the extraordinary *attrition* of the ſolids and fluids to the ſtandard of health, and which may thin the blood, diſſolve *viſcid* coheſions, and free it from its morbid qualities: and when all this is accompliſhed, the appearances of the urine will be changed; and ſuch a colour and ſuch a ſediment will enſue, as will manifeſt that the fever is drawing to a happy period, and that health is returning to the patient.

§ 740. But whenever we meet with a *high-coloured* urine in fevers, remaining clear without ſediment, it diſcovers that there is an intimate and tenacious mixture of the *oils*, *ſalts*, *earth*, and *water* of the animal fluids; and that the diſeaſe is like to continue long, and with great danger.

§ 741. The curative indication therefore in ſuch caſes, leads us to contrive our *alterative* medicines ſo as to remove that tenacious mixture or coheſion of the *oils*, ſalts, *earth*, and water, which ſubſiſts in the animal fluids.

§ 742. But, 2. The *high-coloured* urine (§ 726.) ſometimes occurs in thoſe fevers which are produced by *diſſolvent* cauſes.

§ 743. And we know that the fever reſults from ſuch cauſes, if we find the *heat* of the patient's body very moderate, and his pulſe, though quicker than in the time of health, yet moderate as to force.

§ 744. The *high* colour of the urine in theſe fevers proceeds from a comminution of the red globules of the blood, and from a diſuniting and ſeparating ſome particles of the ſolids from thoſe wherewith they cohered, &c. effected by *acrid* diſſolvent particles diffuſed in the blood.

§ 745. The curative indication in fevers of this ſort is to direct thoſe alterative medicines which may free the blood from its diſſolvent quality, and ſtrengthen the coheſion of the conſtituent parts of the muſcular fibres and veſſels.

§ 746. V. The *flame-coloured* URINE, *clear*, *thin*, and without ſediment, in fevers, has a very threatening ſignification: it ſeems to proceed from the ſame cauſes which produced the laſt-mentioned urine; only with this difference, viz. that the cauſes of this ſymptom are more *ſtrong* and *violent*; and conſequently, that the ſignification of it is worſe, and ſhews that the uſe of proper *diſſolvents* and *attenuants* is more neceſſary.

§ 747. VI. The *turbid* or *muddy* URINE, (I mean that *high-coloured* urine in fevers from inſpiſſating cauſes, which, though it comes from the patient *clear*,

clear, yet becomes *muddy* when *cold*, ſo that one cannot ſee through it, and remains in this ſtate, dropping *no* ſediment,) is another ſymptom to be conſidered.

§ 748. This (§ 747.) ſeems to be the effect of an imperfect or deficient *attenuation*, or *alteration* of the morbid quality of the blood: in this urine, the ſolid particles, excreted with it, recede in ſome meaſure from their cloſe union with the aqueous parts of it, and form numberleſs *nubiculæ* (which give the *muddy* appearance, and render the urine *opaque)* and diſcover that the morbid quality is abated, and the ſuperfluous and excrementitious humours in ſome meaſure prepared for evacuation.

§ 749. And the reaſon why the ſolid particles, excreted with this urine, do not ſink to the bottom of it, and make a *ſediment* there, ſeems to be becauſe the comminution of them was not greater; and becauſe their coheſion with the other parts of the animal fluids was not ſufficiently deſtroyed: for if the morbid qualities had been rendered minute enough, and incoherent with the aqueous parts, there is reaſon to apprehend they would run together, and form corpuſcles heavy enough to ſink to the bottom of the urine.

§ 750. It may help us better to underſtand this matter if we conſider the proceſs in making of *ſalt*.

In the ſolution of *ſalt-rock* with water, the particles of ſalt are in a manner divided and ſubdivided nearly into their minima.

§ 751. They are diffuſed, and ſuſpended in the water, and are of that bulk as to have an equal levity or gravity with the water in which they are diffuſed.

§ 752. Now by the action of the fire (evaporating and leſſening the quantity of water, and keeping on an aſcending motion through the body of the water to the air above it) it neceſſarily follows:

1. That the particles of *ſalt* are ſucceſſively carried upwards to the ſurface of the water:

2. That when, on the ſurface of the water, they come to a certain nearneſs, they attract each other, run and cohere together; and form large corpuſcles, which gradually increaſe in bulk by the acceſſion of others:

3. That when thoſe corpuſcles attain a certain magnitude they become ſuperficially heavier than the water in which they were diffuſed; and then ſink to the bottom of it; from which they are taken up in the form of thoſe ſmall cryſtals in which we afterwards ſee them.

§ 753. And thus in the urines of ſick people, when the *ſaline* and other excrementitious particles diffuſed in the water of the urine, come to attract each other, and form corpuſcles ſpecifically heavier than the aqueous part of the urine, they ſink to the bottom, and conſtitute that appearance which we call the SEDIMENT.

§ 754. This ſort of urine (§ 747.) allows us ſome ground to hope for the patient's recovery; if his other ſymptoms are favourable: and when there is ſufficient ſtrength in the action of the vital organs, we may expect, in a little time, to ſee a urine that will drop a good ſediment: but if the vital ſtrength is much ſpent, and the vital FUNCTIONS very weakly performed, we have great reaſon to fear the event of the diſtemper.

§ 755. We may eaſily perceive, from what has been obſerved, the great importance of purſuing the intention of altering the morbid quality, or qualities, which produced the diſeaſe; and muſt not forget that ſuitable *cordials* are neceſſary, when the vital ſtrength decreaſes.

§ 756.

§ 756. VII. That urine in acute diſeaſes which appears *thick* and *muddy* as ſoon as it is diſcharged, and remains ſo, like the ſtale of *horſes*, without dropping any ſediment, is produced by a very great attrition both of the fluids and ſolids. And the reaſon why it drops no ſediment is, becauſe the union between the ſolid particles excreted and the aqueous parts of the urine has not been ſufficiently deſtroyed.

§ 757. And therefore thoſe ſolid particles cannot exert their natural *attractive* quality; cannot run together, and form corpuſcles of a gravity ſufficient to ſink them to the bottom in the appearance of a ſediment.

§ 758. This ſort of urine ſhews, that the alteration of the morbid quality or qualities, which produced the diſeaſe, has not, as yet, been carried on ſufficiently to ſecure the recovery of the patient.

§ 759. And therefore it ſhews that the event of the diſtemper remains doubtful, and that proper *alterative* medicines ſhould be given with greater diligence.

§ 760. VIII. The *frothy* URINE, which has *bubbles* riſing, and abiding long on its ſurface, is a ſymptom that ſometimes happens; and therefore we ſhould be acquainted with the cauſes and ſignification of it, and what is proper to remove its morbid quality.

§ 761. The BUBBLES we ſee on the ſurface of urines are compoſed of air incloſed with a covering of many parts or particles of the urine *cohering* together, like a very thin membrane; and ſeem to be produced in this manner, viz. that the motion which happens in making water, or by ſhaking the urinal, expels particles of air from the *interſtices* of the *urine*; which particles of *air*, being diſlodged and rarified, cannot (upon the account of their levity) but aſcend to the ſurface of the urine. And when there is a tenacious coheſion between the *ſaline*, *oleaginous*, and other ſolid particles excreted from the kidneys, and the aqueous parts of the urine, then the particles of air, aſcending to the ſurface, do thruſt before them, or lift up a proportionable number of the globules of urine, which cohering for a while incloſe the air, and form thoſe appearances we call *bubbles* or froth.

§ 762. This ſymptom, therefore, diſcovers to us that there is a morbid union, or a too ſtrong coheſion of *oleaginous*, or *pinguedinous*, and *ſaline*, and other ſolid particles with the aqueous parts of the urine.

§ 763. And from this ſtate of the urine (§ 762.) we may infer, that there is the like *morbid union*, or too ſtrong a coheſion of the ſolid parts of the blood among themſelves, and with the *ſerum*, or aqueous parts of it.

§ 764. This ſort of urine has a very *ſaponaceous* quality:

§ 765. And ſhews that the patient is in great danger, as it diſcovers a cloſe union of thoſe parts of the animal fluids which ſhould in a manner be incoherent.

§ 766. We may, from the nature of this ſymptom (§ 760.) infer the neceſſity (*not* of diminiſhing the quantity of the animal fluids, but) of preſcribing ſuch *alterative* medicines, as may deſtroy the *coheſive quality* which ſubſiſts in them, and which prolongs the diſeaſe, and increaſes the danger of the patient.

§ 767. This ſymptom ſometimes happens in ſome *chronical* diſtempers: and when we meet with it, we may learn from it much of the morbid ſtate of the blood, and what ſort of remedies we ſhould adviſe for the recovery of the ſick.

§ 768. IX. *Coloured* URINE in diſeaſes, which has neither ſmell nor taſte, is another morbid ſymptom to be conſidered.

§ 769. This ſort of urine is *coloured*, becauſe *terrene* and other ſorts of ſolid particles from the blood, and from the veſſels, (of an inſipid and inodorous nature,) are excreted by the kidneys.

§ 770. It is void of ſmell and taſte, becauſe the urinous *ſalts*, and other ſorts of particles, which give a ſcent and taſte to the urine, are not excreted with it, but *remain* circulating with the blood.

§ 771. Now the retention in the blood of ſuch humours and particles as ought to be excreted from it, gives us reaſon to apprehend in acute diſeaſes that the life of the patient is in imminent danger.

§ 772. We cannot poſſibly conceive all the pernicious effects which may follow upon the retention of thoſe *ſalts* and other particles, which ought to be evacuated through the kidneys.

§ 773. But the retention of them ſhews what ought to be done for the relief of a patient, viz. to preſcribe ſuch *alterative* medicines as may attenuate the blood, and deſtroy the *viſcid* coheſive quality of it; and comminute and render thoſe parts of it incoherent and minute enough to paſs through the excretory *tubuli* of the kidneys.

§ 774. X. *Colliquative* URINE is another ſymptom that needs our conſideration.

I call that a *colliquative* urine, which is *full-coloured*, *much in quantity*, looks *fat* or *oily*, and is attended with dejection of ſpirits, and loſs of fleſh and of ſtrength.

§ 775. This (§ 774.) proceeds from *diſſolvent* cauſes, breaking the texture of the animal fluids, comminuting their component parts, and relaxing the veſſels:

§ 776. And therefore evidently ſhews the patient to be in great danger, and that thoſe *alterative* medicines ſhould be directed, which may change the figuration of the *acrid*, *diſſolvent* particles diffuſed in the blood, or may ſheathe them, and ſo remove the *diſſolvent* quality brought into it; and likewiſe ſuch remedies as may ſtrengthen the veſſels by increaſing the coheſion of their conſtituent parts, and which may repair the waſte of them.

§ 777. XI. That URINE which appears of a *dark red colour*, and remains *clear*, without dropping any ſediment, deſerves our notice.

§ 778. The colour and conſiſtence of this urine ſeem to be produced by great quantities of particles broken off from the red globules, and excreted by the kidneys with the water of the urine.

§ 779. This (§ 777.) may be occaſioned either, 1. By a violent *attrition* of the component parts of the blood; and when this is the caſe, we may know it by the unuſual *ſtrength* and *quickneſs* of the pulſe, and exceſſive heat of the body.

§ 780. And when this ſymptom is produced by the cauſe now mentioned, we may eaſily apprehend the *fitneſs* and neceſſity of preſcribing thoſe *alterative* medicines, which may thin and refrigerate the blood, and thereby reduce the vital heat, and the force and celerity of the pulſe to the ſtandard of health: *nitrous* ſalts, and *acids*, vegetable and chymical, &c. are proper to this intention.

§ 781. Or, 2. This ſymptom (§ 777.) may be produced by *diſſolvent cauſes*; and we may be ſure that it is ſo produced, if, upon examining the patient, we find his pulſe moderate as to ſtrength and quickneſs, and that there is no great exceſs of heat.

§ 782. When this (§ 781.) is the caſe, the curative indications are the ſame as in fevers from diſſolvent cauſes.

§ 783. The reaſon why this urine drops no ſediment or cloud, is becauſe there is ſo ſtrong an *union* and coheſion betwixt thoſe particles (which give the *colour)* among themſelves, and with the aqueous parts of this urine, that they cannot run together, and form corpuſcles heavy enough to ſink to the bottom of it.

And this (§ 783.) gives us ground to apprehend that there is likewiſe ſuch a firm union between the ſeveral parts of the blood as is inconſiſtent with the recovery of health, unleſs it be diſſolved by proper *alterative* medicines.

§ 784. XII. The *bloody* URINE in acute diſeaſes is a terrible ſymptom. I mean that urine, which looks like blood, and drops a *grumous ſediment*, like the *coagulum* of blood taken away by phlebotomy, and ſeparated from the ſerum.

§ 785. This commonly proceeds from a very *diſſolvent* quality ſubſiſting in the blood, or acrid particles of a diſſolvent nature; and ſhews us the neceſſity of ordering for the patient ſuch *alterative* medicines as may deſtroy the diſſolvent quality, and give a firm coheſion to the conſtituent parts both of the fluids and ſolids.

§ 786. For theſe purpoſes the *ſpiritus vitrioli*, *bolus gallica*, *vel armena*, *terra rubrica*, i.e. ruddle, or Engliſh bole, *terra japonica*, *radix tormentillæ*, *coccinella*, *ſal martis*, and the *balſamum reſtringens* deſcribed in my Treatiſe of the Small-pox, are ſuitable remedies.

END of LECTURE VI.

LECTURE VII.

In which the conſideration of the ſymptoms in the urines of ſick people are continued: and obſervations made on the different appearances of ſtools.

§ 787. XIII. *BLack* URINE which drops a *black ſediment* in acute diſeaſes is a moſt threatning ſymptom; produced by the ſame cauſes (§ 785.) in a different degree.

§ 788. This urine (§ 787.) ſhews, that the *diſſolvent quality* of the blood is very active, and allows very little ground to expect the patient's recovery. The curative indications and the proper remedies are the ſame as in the laſt-mentioned ſymptom.

§ 789. When theſe two laſt-mentioned ſymptoms occur, the pulſe is generally weak, the heat of the body moderate, and the veſſels *lax*, &c.

§ 790. XIV. The *cadaverous* URINE: I call that a cadaverous urine, which hath the ſcent of a dead carcaſe.

This reſults from diſſolvent cauſes producing a very great *putrefaction* of the animal fluids, or veſſels, or of both; ſimilar to that which always follows death.

§ 791. This ſymptom ſhews that the patient is in the extremeſt danger, and that if the *putrefaction* be not ſoon ſtopped, the vital ſtrength will be deſtroyed, the vital organs rendered incapable to perform their functions, and a ſpeedy period put to the life of the ſick.

§ 792. It muſt be obſerved alſo, that the ſtronger the *cadaverous* ſcent of the urine is, the nearer and more certain is the approach of death.

§ 793. The curative indications are the ſame as in the caſe of a *bloody urine*; and the medicines which I mentioned as proper for removing that ſymptom, are the ſuitable remedies in this deplorable ſtate of things.

§ 794. XV. *Frequent* diſcharges of URINE in ſmall quantities is a ſymptom ſometimes occurring in acute diſeaſes, when they have made a ſad progreſs.

§ 795. And it is commonly produced by the *acrimony* of the urine excreted into the bladder.

§ 796. When there is a very *acrimonious quality* in the blood, acrid particles continually paſs thro' the excretory *tubuli* of the kidneys with the urine, and render the urine acrimonious.

§ 797. And an acrimonious urine (lodging in, and paſſing continually through the bladder, during the progreſs of ſuch diſeaſe) *incides* and waſhes off a great part of the *mucus*; which in time of health defends the ſphincter of the bladder from uneaſy ſenſations.

§ 798. And the mucous covering being diminiſhed, or made thinner, the acrid particles of the urine are felt by the nerves terminating in the ſphincter; and the ſphincter of the bladder is then ſtimulated to relax, and let every little quantity of the urine paſs off as ſoon as brought into the bladder.

§ 799. This ſymptom therefore ſhews, that the proper *alteratives* have not been given to the ſick, or at leaſt *not* in ſufficient quantities.

§ 800. For removing this ſymptom, thoſe medicines, which may alter the *acrimonious* quality of the *blood*, and take off the acrid *ſtimulus* from the *urine*, are the proper and needful remedies.

§ 801. And then for *ſheathing* the acrimonious particles diffuſed in the blood, the following remedies may be of ſervice, viz.

℞ *Mucilag. tenuis rad. althææ* ℥xxviii. *aq. nucis moſcatæ* ℥ii. *ſyr. de althæa, ſyr. balſamic.* āā ℥i. *m. f. apozema, cujus tepidè capiat cochl.* vii. *vel* viii. *horis tertiis, vel quartis*; *vel,*

℞ *Amygdal. dulc. excortic.* ℥i. *ſem. papav. alb.* ʒii. *aq. cinnamomi ſimpl.* ℥xiv. *aq. nucis moſcatæ ſyr. de althæa* āā ℥i. *et f. emulſio: de qua tepidè bibat cochl.* vi. *horis ſecundis vel tertiis.*

§ 802. XVI. *Involuntary* evacuation of the URINE.

I call that an *involuntary evacuation* of it, which happens (while the patient is awake and ſenſible) from an incapacity of retaining his water, which therefore comes away againſt his will.

§ 803. The cauſe of this ſymptom is a *relaxation* of the muſcular fibres of the *ſphincter* of the bladder.

And as it rarely happens till after the diſeaſe has made a terrible progreſs, ſo it diſcovers a general weakneſs, and *laxity* of the muſcular fibres, and animal veſſels of the whole body. It ſhews ſuch a general *relaxation* of the ſolids, as will ſoon render them incapable of their natural *contractile* motion, which is neceſſary to carry on the circulation of the blood, and to continue the ſubſiſtence of life: and thus it is a melancholy ſign, that the death of the patient is near approaching.

§ 804. For removing this ſymptom the remedies muſt be taken out of the claſs of *reſtoratives*; and ſuch medicines ſhould be preſcribed as may recover the ſtrength of the action of the vital organs to the ſtandard of health; warm and contract the muſcular fibres, and reſtore the natural *contractile* motion to the animal veſſels.

§ 805. And for theſe purpoſes the following medicines are proper, viz.

℞ *Pulv. contrayerv. comp. corallii rubri ppt.* āā ℈ii. *ſal. martis gr.* vi. *aq. cinnam. ſimpl.* ℥vi. *aq. cinnamomi ſpirituoſæ* ℥i.
Sp. roriſmarini.
Sp. lavendul, comp. āā ʒii.
Sp. vitrioli gut. xx.
Syr. balſamic. ℥ſs. *m. f. julepum: cujus capiat cochl.* ii. *ſingulis, vel alternis horis, quamdiu poſtulaverit occaſio, phiala prius agitatâ. Et externè regio ſphincteris veſicæ ſequenti miſturâ foveatur.*

℞ *Sp. vini rectificat.* ℥iſs.
Sp. Lavendul. comp. ℥ſs. *m. pro fotu.*

§ 806. XVII. The *inſenſible* evacuation of URINE is a terrible ſymptom, which proceeds from ſuch a delirium, or diſorder of the ſenſes, as hinders the ſick perſon from perceiving any ſtimulation from the quantity or quality of the urine in his bladder.

§ 807. It is *not* eaſy in this caſe to know whether the muſcular fibres of the ſphincter of the bladder are relaxed, unleſs there be a general laxity of the veſſels, and a flabbineſs of the fleſh: but in ſuch a caſe, we may reaſonably conclude, that the ſphincter of the bladder is likewiſe lax. But though there ſhould be no ſuch relaxation, yet this is a threatening ſymptom, and ſhews ſuch an obſtruction, or *inflammation* of the brain, as is like to terminate in death.

This ſymptom can be removed only by abating the fever, and thereby taking off the *delirium* which depended on it.

§ 808. An inſtance of this, in combination with other deplorable ſymptoms, you may ſee in the 25th hiſtory (part 2.) of my Treatiſe on the *ſmall-pox*; with an account of the medicines by which, with the bleſſing of God, the patient was recovered from them all.

§ 809. XVIII. The URINE in acute diſeaſes which appears much the *ſame as in time* of health, is *no* promiſing ſymptom.

§ 810. This rarely happens, except in ſome *putrid* or peſtilential fevers.

§ 811. It ſhews, indeed, that there is an excretion by the kidneys of natural, excrementitious, *ſaline*, *terrene*, and other ſuperfluous particles; but at the ſame time it ſhews, that the morbid quality which produced the diſtemper ſtill ſubſiſts in the blood.

§ 812. The curative indications, in regard to the patient, are to be deduced from other ſymptoms, &c.

§ 813. XIX. *High-coloured* URINE, with a *lateritious* or reddiſh ſediment, like brick-duſt, or red bole, is another morbid ſymptom which ſhould be conſidered and underſtood.

§ 814. The cauſe, producing the *colour* of it, may be eaſily underſtood, from what has been before obſerved concerning *high-coloured* urines.

§ 815. The largeneſs of the *ſediment* reſults from the great quantity of *ſolid* particles excreted by the kidneys, which have attracted each other, cohered, and formed corpuſcles of a greater gravity than that of the water of the urine.

§ 816. The *reddiſh colour* of the ſediment ariſes from the *quality* of many of the ſubdividing particles, broken off from the *red globules* of the blood by a violent *attrition* of the component parts of them, which always precedes the coming away of this ſort of urine, and is the productive cauſe of it.

§ 817. This ſymptom, in CONTINUAL and REMITTING fevers, ſhews not only that there has been a great *attrition* of the fluids, and their containing veſſels, *but alſo* that the veſſels are *lax* and weak, and that the diſeaſe is like to be of a *long* continuance; becauſe it has been obſerved, that diſeaſes attended with this ſymptom do not ſoon come to a period.

§ 818. It has likewiſe been obſerved, that when this ſymptom occurs and continues, it has been followed with *colliquative ſweats*, or *urines*, or *ſtools*, or *ſpitting*, and ſometimes terminated in conſumptions, or dropſies: and therefore that we have reaſon to fear and expect ſuch events, when we meet with this ſymptom, &c.

§ 819. I muſt add, that if the reddiſh ſediment appears as if mixed with *bran*, or *looks ſcaly*, it is ſtill a more threatning ſymptom.

§ 820. It alſo ſhews that the *globules* and other particles, broken and comminuted by the violent *attrition*, and ſeparated from thoſe wherewith they cohered, become *acrid*, and acquire a *diſſolvent* quality, &c.

§ 821. The conſideration of theſe things may convince us, that in the *progreſs* of ſuch diſeaſes it will become neceſſary to preſcribe medicines of that *alterative* nature, which may deſtroy a *diſſolvent* quality ariſing in the blood; and which may remove the *laxity* of the veſſels, and recover them to their natural tenſeneſs.

§ 822. When this ſymptom occurs in INTERMITTING FEVERS, it ſhews, that the febrile *paroxiſm* which preceded it was very *ſtrong*: and from what has been obſerved concerning this urine in *continual* fevers, we may be directed better to preſcribe for the cure of thoſe *intermitting* fevers which have this ſymptom attending them.

§ 823. XX. The URINE, which in the progreſs of fevers grows leſs *high-coloured*, and returns nearly to the colour of Canary wine, looks clear, and has *nubeculæ*, or clouds formed in it (after it has ſtood a ſufficient time for the ſolid particles, heavier than the water, to ſubſide in it) is a good ſymptom, ſhewing that the *morbid quality*, which produced the diſeaſe, is in a great meaſure altered.

§ 824. This ſort of urine often precedes that which ſignifies the happy concluſion of the fever: and it has frequently been obſerved, that the nearer the *cloud* approaches to the bottom of the urine, the ſooner we may expect that *ſediment*, which ſhews the fever to be happily coming to a period.

§825. XXI. Laſtly, the URINE in fevers, which comes away *clear*, and nearly of the natural healthy colour, and ſoon drops a *large*, *equal*, *white*, and *light* ſediment, commonly ſignifies that the morbid quality, which produced the diſtemper, is removed; and that health is returning to the patient.

§ 826. This obſervation is confirmed by numberleſs facts daily occurring; ſuch an urine commonly preceding the happy period of fevers.

§ 827. VI. I proceed now to diſcourſe on the SIXTH *claſs* of SYMPTOMS, viz. thoſe which happen in the *inteſtinal* evacuations.

§ 828. But in order to the forming juſt ideas or right notions of the ſeveral ſymptoms which happen in the evacuation from the INTESTINES, it will be proper to premiſe ſome things concerning it, as in a ſtate and time of health particularly.

§ 829. Obſ. 1. That the natural proportion of the quantity evacuated this way, in time of health, is about the *eighteenth* part of the whole that is excreted from the body; or, as 1 to 18, or 4 to 72.

§ 830. For, according to Dr. KEIL's computation, the mean quantity excreted by STOOL, in a natural day, is four ounces: and the mean quantity of meats and drinks, ſuppoſed to be taken into the ſtomach in the ſame ſpace of time, by thoſe that live temperately, is ſuppoſed to be *four pounds* and *half*; which, at ſixteen ounces to the pound, do make ſeventy-two ounces.

And from adult perſons, enjoying perfect health, the quantity excreted is in the whole equal to the quantity taken in, &c.

§ 831. Obſ. 2. That the colour of this excrement, even in the time of health, is different in bodies of different conſtitutions and ages; and even different in the ſame bodies, according to the different ſorts of food they take.

§ 832. For they that eat plentifully of *ſpinach*, or *green ſavoys*, &c. ſhall have their ſtools of a greeniſh colour the next day, or next but one. And drinking *chocolate* daily ſhall make the ſtools of a much *deeper brown*, than otherwiſe they would be; as *chalybeate* medicines will make them *black.*

§ 833. But the uſual natural colour in the time of health is brown; from a mixture of *bile* with the excrements, ſometimes lighter, and ſometimes deeper. And the conſiſtence of the stool ſhould be ſo ſolid, as to be figured by the *rectum*; and as to ſcent, it ſhould not be very fœtid.

§ 834. Obſ. 3. That a certain degree of moiſture in theſe excrements is neceſſary to their paſſing eaſily through the *rectum.*

§ 835. Having thus mentioned the *quantity*, and the moſt obvious *qualities*, of the matter evacuated from the *inteſtines* in the time of health, I ſhall conſider the principal ſymptoms of this *excretion*; particularly,

§ 836. 1. Stools *deficient.* This is a ſymptom to be conſidered, as to its cauſe, ſignification, and remedies.

§ 837. Every perſon, in perfect health, has a diſcharge from the inteſtines as conſtantly every day, as he has evacuation daily by *urine*, and *inſenſible perſpiration:* and to the amount of about four ounces a day, more or leſs, according to the bulk of body, and quantity of food taken into the ſtomach: that is, to the proportion of the eighteenth part of the aliments received into the ſtomach.

§ 838. But if, inſtead of a ſtool daily, the perſon has a ſtool only once in two, or three, or four days, or more; there is a deficiency in the quantity of this excretion.

§ 839. When we meet with this ſymptom, whether in *acute* or *chronical* diſeaſes, we may conclude from it, that the *fæces alvinæ*, the *inteſtinal* excrements, are *dry* and hard.

§ 840. And this *dryneſs* and *hardneſs* of them is the immediate cauſe of COSTIVENESS, or the reaſon why the excrements cannot be propelled daily through the inteſtines, and out of the body, *per anum*, by their *periſtaltic* motion.

§ 841. Let us therefore inquire, what is the CAUSE of the *dryneſs* and *hardneſs* of the excrements; which will appear to be, that all the liquid parts of the CHYLE are carried through the *lacteals* and *vaſa inhalantia* into the blood.

§ 842. And this extraordinary and morbid flow of all the liquid part of the *chyle* into the blood, may be occaſioned, either 1ſt, By augmented diſcharges of liquid to and through the external *ſuperficies* of the body by *inſenſible perſpiration*, or by *ſweat*. For an increaſed flux of fluid to and through the external *ſuperficies* of the body muſt make a *revulſion* of fluid from the inteſtines.

§ 843. Or, 2dly, It may be occaſioned by an extraordinary increaſe of the quantity of urine, for the ſame reaſon.

§ 844. Or, 3dly, By the *openneſs* and *laxity* of the *lacteals*, and of the *vaſa inhalantia*.

§ 845. Or, 4thly, By an exceſs of the *vital heat*, and a quicker motion or circulation of the blood through its containing veſſels, which produces a quicker influx of fluid into the blood from all veſſels which empty their contained fluids into the ſanguine veins; conſequently a quicker flow of lymph from all the lymphatic veins, which terminate in the ſanguine veins; and a quicker flow of *chyle* through the *lacteals* into the blood; and a quicker flow of humours from all the *vaſa inhalantia*, that terminate in ſanguine veſſels, by a ſort of *revulſion* from them.

§ 846. This ſymptom, therefore, directs us to preſcribe thoſe medicines which may in ſome meaſure cloſe or leſſen the diameter of the orifices of the *lacteals*, and the *vaſa inhalantia*, which paſs off from the inteſtines, &c.

§ 847. And ſuch medicines (if they prove effectual) will, by leſſening the diameter of the veſſels mentioned, occaſion leſs fluid to paſs thro' them; and conſequently more liquid to remain with the excrements of the inteſtines: and hereupon the *coſtiveneſs* muſt ceaſe.

§ 848. For this purpoſe *chalybeates* are very proper, mixed with thoſe *alteratives* which may abate any exceſs of the vital heat, and render the motion of the pulſe and blood ſlower.

§ 849. And I may obſerve, from my own experience, that *chalybeates* may be preſcribed not only in *chronical* diſtempers, but alſo in *acute* diſeaſes; and not only with ſafety, but very beneficially for the ſick.

§ 850. But when we meet with this ſymptom, whether in *chronical* or *acute* diſeaſes, we muſt remember to adviſe a liberal drinking of diluting liquors, &c.

§ 851. PURGING MEDICINES are often preſcribed for removing *coſtiveneſs:* but how do theſe remedies remove it?

§ 852. I apprehend that they do it by their *ſtimulating quality*; thereby contracting the membranes of all the glandules and lymphatic veſſels ſituated in the inteſtines, which naturally emit their contained humours into the cavity of the inteſtinal tube, and occaſioning them to ſqueeze out into it their contained fluids.

§ 853. But it may be obſerved, that *cathartic* medicines generally render the orifices of the *lacteal* veſſels, and indeed of all the veſſels which convey fluids from the inteſtines into the blood, more open than they were before; which is a manifeſt reaſon why the body becomes more coſtive after taking a purge;

§ 854. And ſhews that ſome purging medicines are rather more proper, when the ſtools are too frequent and too thin.

§ 855. II. STOOLS *frequent*, *thin*, and *watery*, without or with but little excrement, happen to perſons both under *acute* and chronical diſeaſes.

And a little conſideration will lead us to apprehend that this ſymptom muſt be produced by one or other of theſe following cauſes, viz.

§ 856. 1. By ſome great diminution of the quantity uſually excreted by the inſenſible *perſpiration*. For when ſuch a diminution happens (if neither the quantity of *urine*, nor weight of the body be increaſed) there muſt then be a greater diſcharge of excrementitious humours through the glandules and lymphatic veſſels (ſituated in the membranes of the inteſtines) into the inteſtinal tube, than in time of health; and conſequently the ſtools muſt become more *frequent*, more *thin*, and larger than in time of health; in proportion to the greater quantity of humours evacuated this way.

§ 857. And we may be ſure this is the caſe, if (upon examining the patient) we find that the quantity of this urine is not more than uſual, and yet that his body is decreaſing in bulk.

§ 858. And when this is the caſe, we are to conſider what was the cauſe that diminiſhed the *inſenſible perſpiration:* and commonly it is ſome *viſcid quality* of the blood, or particles mixed with it, too bulky to paſs through the perſpiratory *tubuli*; and therefore we ſhould adviſe thoſe *alterative* medicines, which may remove that quality, and render the matter of this excretion fit to paſs out of the body this way: and thus muſt we endeavour to recover the inſenſible perſpiration to the ſtandard of health.

§ 859. Or, 2. *Frequent*, *thin*, and *watery* STOOLS; that is, STOOLS without the common excrements, may be occaſioned by *diſſolvent* cauſes rendering the animal fluids *too thin*, and their veſſels *lax*, and the diameter of their cavities enlarged. And when this is the caſe, greater quantities of the lymphatic fluid will paſs through the *ſecretory*, and *excretory tubuli* (ſituated in the membranes of the inteſtines) into their cavity, and produce the *watery ſtools*, in proportion to the quantity of the lymphatic fluid excreted this way; and thus make a *lymphatic looſeneſs*.

§ 860. We may know that this is the caſe, if we find the PULSE *quick* and *weak*, and the heat of the body temperate; and if we inſpect the ſtools, and find that they are neither *chylous*, nor *mucous*, nor *bloody*, but appear *thin* and *watery*, and little or no excrements.

§ 861. And when the *watery ſtools* proceed from the laſt cauſe aſſigned, we may eaſily apprehend the importance of preſcribing thoſe *alterative* medicines which are proper to remove a *diſſolvent* quality from the blood, and to reduce the *lax* fibres and veſſels to their natural tenſeneſs.

§ 862. The common mixture of *bole* and *diaſcordium* is one very proper remedy, when the *watery* STOOLS are occaſioned by a *diſſolvent* quality ſubſiſting in the blood.

§ 863. III. STOOLS which are *chylous*, do ſometimes happen to ſick perſons

The ſtools are *chylous*, when the *chyle*, inſtead of paſſing through the lacteals into the blood, glides down the inteſtines, and is evacuated *per anum*.

§ 864. When this ſymptom happens, it can only be certainly known by inſpecting the *ſtools*.

§ 865. The cauſe of this is ſome obſtruction of the *lacteals*, hindering the admiſſion and paſſing of the chyle through them into the blood.

§ 866. This obſtruction may be produced either 1. By *viſcid humours* filling the orifices of the *lacteals*, which ſhould be open to receive the chyle; or, 2. by a compreſſion of the lacteals from a diſtention of the ſanguine arteries, next adjacent to them.

§ 867. We may eaſily apprehend, that for removing this ſymptom thoſe *alterative* medicines ſhould be preſcribed which may attenuate *viſcid* humours, take away a *viſcid* quality from the blood, render the circulation of it eaſy through the minuteſt ſanguine veſſels; and theſe remedies may be called *deobſtruents*.

§ 868. IV. *Mucous* STOOLS are likewiſe to be conſidered.

The STOOLS are *mucous*, when that *ſlimy*, *viſcous* matter, which is ſecreted by the mucilaginous glandules, and which is the covering of all the internal *ſuperficies* of the guts, and always adhering to it in time of health, comes away with the excrements, or by ſtool without excrements.

§ 869. But it cannot be known when this ſymptom happens without an inſpection of the ſtools.

§ 870. The productive cauſe of them (§ 868.) is either ſome great *acrimony* of the chyle, or in thoſe fluids which are ſecreted from the blood, and conveyed into the cavity of the inteſtines; which *acrid humours* incide and ſeparate, from the membranes of the inteſtines, their defenſative *mucus*, which, when ſeparated, comes away by ſtool.

§ 871. This ſymptom therefore ſhews, that there is an *acrimony* in the chyle, or in the blood, or in both: and it ſhews alſo that thoſe *alterative* medicines which may deſtroy the *acrimonious* quality are the proper and needful remedies.

§ 872. V. Stools that are *frequent* and *looſe*, but neither *watery*, nor *chylous*, nor *mucous*; that is, ſtools with excrements much diluted, deſerve notice.

§ 873. Theſe (§ 872.) generally are occaſioned by a diminution of ſome other evacuation, and either that of the inſenſible perſpiration, or that by urine.

§ 874. The diminution of the diſcharge by inſenſible perſpiration produces in ſome perſons catarrhs and coughs, in others a flux of watery humours from their eyes and noſe, and in others copious evacuation by *urine:*

And in ſome a *diarrhœa*, or *frequent* and *looſe* ſtools.

§ 875. When *frequent* or *looſe* ſtools are produced by a diminution of ſome other excretion, they are a *vicarious evacuation* of great advantage to the patient, and often the means of preventing a more dangerous diſeaſe.

§ 876. This ſymptom has often prevented a continual fever from being the conſequence of catching cold.

§ 877. The conſideration of theſe things may convince us, that every *looſeneſs* is not preſently to be ſtopped: to be ſure thoſe ought not, which are occaſioned by the diminution of ſome other excretion; theſe ought not to be cured by any other method than that of recovering the diminiſhed evacuation to the ſtandard of health.

§ 878. It appears, from what has been obſerved, very proper to inquire, whether the patient diſcharges his uſual quantity of urine.

§ 879. If the quantity of his urine has been leſs than uſual for ſome days, we have reaſon to apprehend that this may be the occaſion of his looſeneſs.

§ 880. If we find that there has been no abatement in the quantity of his evacuation, and find the *fleſh dry*, and the pores cloſer than uſual, which may be known in ſome meaſure by *feeling*, we then ſhall have reaſon to think, that the *inſenſible perſpiration* has been leſs than it ought to be.

§ 881. And when a *looſeneſs* reſults from the cauſes mentioned, I apprehend that the rational method of cure is *not* by *aſtringents* to ſtop it; but by proper *alterative* medicines to remove the *morbid quality*, and the obſtructions conſequent thereupon; and thus to recover the quantity of it to its due proportion.

§ 882. And for this end JULEPS, compoſed of *chalybeate*, and attenuating ſalts, e. g. *ſal martis* with *ſal nitri*, *ſal prunell. ammoniac crud.* and ſometimes with *ſal volat.* c. c. are proper, and often of ſufficient efficacy.

§ 883. But ſometimes the *frequent* and *looſe* STOOLS are occaſioned by *crude* and indigeſted aliments; or what is commonly called, a SURFEIT.

§ 884. And when this is the caſe, the patient has perceived his ſtomach to be loaded, and has been afflicted with great ſickneſs in his ſtomach, and anxiety, and with great diſorders and flatuſſes, &c. in his bowels.

§ 885. And therefore, while this ſymptom is recent, we ſhould aſk the patient whether he has not eaten ſomething which diſagreed with his ſtomach, and whether he perceived very uneaſy workings or motions in his bowels.

§ 886. If this (§ 885.) is the caſe, the proper method for his relief, is either, 1ſt, to give *aceti* ʒii. or, 2dly, to order a vomit of carduus tea, or *vinum ipecacoanhæ*, or *rad. ipecacoanhæ.*

§ 887. And after the operation of the emetic, to direct ſome ſaline, ſtomachic draught; ſuch as the following, viz.

℞ *Sal abſinthii* ℈i. *ſucc. limon.* ʒſs. *aq. menth. vulg. ſimp.* ʒi. *aq. cinnamon. ſpirituoſ.* ʒſs. *ſacchar. alb. q. ſ. ad ſaporem gratum. m. f. Hauſtus.*

§ 888. This will be proper to recover the ſtomach to its natural ſtate, and to prevent febrile heat in the blood.

§ 889. And the next day ſome gentle ſtomachic purge may be given, e. g. a doſe of the *tinct. ſacra*, or *tinctura rhabarbari*, quickened with *ſyr. de ſpina cervin.*

§ 890. VI. STOOLS that are BLOODY form another ſymptom which needs our conſideration.

Stools are *bloody*, when any blood, more or leſs, comes away by ſtool.

§ 891. And this may happen both under *chronical* diſorders and in *acute* diſeaſes.

§ 892. In *chronical* diſorders it often is a diſcharge of blood from the hæmorrhoidal veins, when, from a certain ſpiſſitude of the blood, the courſe of it through the adjacent ſanguine arteries has been obſtructed, that is, has been rendered much ſlower than it ought to be, whence thoſe arteries become diſtended, and compreſs the hæmorrhoidal veins, and occaſion them to ſwell, and continue ſwelling till they burſt, and then this diſcharge of blood happens.

§ 893. And when it happens to perſons *plethoric*, or too full of blood, this evacuation is very beneficial, and is not to be ſtopped, except it proves exceſſive.

§ 894. The bloody ſtools which happen in a *dyſentery* we ſhall conſider when we come to treat of that diſtemper.

§ 895. *Bloody* stools in *acute* diſeaſes, as in fevers, may be produced either, 1. By a very great *rarefaction* of the blood, in bodies whoſe veſſels are very thin.

§ 896. When this is the caſe it may be known to be ſo, by the *fullneſs*, *quickneſs*, and *ſtrength* of the pulſe, and great heat of the body; but this rarely happens, &c.

§ 897. When the bloody ſtools are the effect of this cauſe (§ 895.) thoſe *alterative* medicines, which take off the rarefaction of the blood, &c. are the proper remedies: but this is very rarely the caſe; I do not remember that I have met with it.

§ 898. 2. This ſymptom in fevers generally is produced by *diſſolvent* cauſes; and we may certainly conclude that it is ſo, when we find the heat of the body temperate, and the pulſe *quick* and *weak*.

§ 899. Thoſe medicines in this caſe (§ 898.) which alter the *diſſolvent* quality of the blood, and change the figuration of the acrid particles mixed with it; and which occaſion the muſcular fibres and animal veſſels to contract, and return to their natural tenſeneſs, are the proper remedies.

§ 900. And thoſe medicines which are proper againſt a *bloody urine* are as proper againſt *bloody ſtools*.

§ 901. And in this caſe ſuitable remedies may be choſen out of the claſs of *alterants*.

§ 902. There are ſome *acids*, and ſome *abſorbents*, which are peculiarly adapted to the curative indications, e. g. *ſp. vitrioli*, *balſamum reſtringens*, *bolus armen.* vel, *gall. lapis hæmatit. ppt. rad. tomentill.*

tomentill. terra japonica, *ſal martis*, &c. of which medicines may be compounded, viz.

℞ *Sal prunellæ*, *ſal martis vulg.* ā ā gr. xv.
Aq. menth. vulg. ſimp. ℥iv.
Aq. cinamom. ſpirituoſ. ℥ii.
Sp. vitriol. gut. xxx.
Sacchar. cryſtallin. ter purificat. q. ſ. ad ſaporem gratum. M. f. julepum: cujus capiat cochl. i. *vel* ii. *horis ſecundis, vel ſæpius, ſi poſtulaverit occaſio, durante cruoris excretione per alvum; vel,*

℞ *Rad. tormentill.* ʒi. *boli gall.* (*vel terræ rubricæ*) *et terræ japon.* ā ā ʒſs. *aq. cinamom. ſpirituoſ.* ℥iiii. *ſacchar. cryſtallin. q. ſ. ad ſaporem gratum. et f. miſtura ad uſum eundem, et ut julepum exhibenda.*

℞ *Rad. tormentill.* ℥ſs. *boli gall.* ʒii. *coq. cum aq. ferrariæ* ℔i. ℥xii. *dein. liquori colato adde*
Sp. vini gall. ℥iv. *et ſic f. decoctum pro clyſteribus* iv. *quorum unus omni quadrihorio tepide infundatur, durante hoc ſymptomate.*

§ 903. VII. Stools *colliquative* are another threatening ſymptom.

I call thoſe ſtools *colliquative*, which are *large*, *looſe*, *oleagenous*, and *fœtid*; and attended with loſs of fleſh, and of ſtrength.

§ 904. Theſe proceed from the ſame *diſſolvent* cauſes which produce the *colliquative urines*, and are to be cured, if curable, by the ſame remedies.

§ 905. VIII. *Cadaverous* stools have the ſame cauſe, and require the ſame remedies as cadaverous urines (§ 790.)

§ 906. IX. Stools *involuntary* have the ſame cauſes and ſignification, and are to be cured by the ſame medicines as the *involuntary* evacuation of urine (§ 802.)

§ 907. X. Stools *inſenſible* are the effect of the ſame cauſe that produces the *inſenſible* coming away of the urine (§ 806.) have the like terrible ſignification, and need the ſame remedies.

§ 908. Now from what has been obſerved concerning the ſymptoms which happen in the evacuations from the inteſtines, the following propoſitions may be deduced, viz. 1. That when we are called to viſit the ſick, we *ſhould always* make inquiry concerning the *quantity* and the *quality* of what comes away by ſtool.

2. That ſometimes it is neceſſary for the phyſician to inſpect the ſtools of his patient, &c.

3. That it is ſometimes alſo needful to get the knowledge of the quantity of what comes off by ſtool every twenty-four hours; and for this purpoſe there is an eaſy method, viz.

§ 909. That the patient in chronical diſtempers, if able, ſhould always make uſe of a cloſe-ſtool, and that only once in twenty-four hours it be emptied, e. g. at ſix o'clock in the evenings.

§ 910. That immediately before the emptying of it, the quantity contained in it be found out by a *gauging-ſtick* prepared for the purpoſe, in the following manner, viz.

Let a ſtick, five or ſix inches longer than the cloſe-ſtool pan is deep, and half an inch wide, be prepared.

Then let four ounces of water be put into the cloſe-ſtool-pan, and then the gauging-ſtick put in perpendicularly, and when taken out let a notch be cut at the point where the wetneſs endeth.

Then put in two ounces more, and then the gauging-ſtick, and in like manner cut another notch, and ſo on till the cloſe-ſtool pan be at leaſt three parts in four filled with water.

§ 911. By this method the knowledge of the quantity that is diſcharged from the body at the times of going to ſtool in the twenty-four hours is obtained.

§ 912. And the knowledge hereof in ſome caſes is of ſignal ſervice, particularly in dropſies called *aſcites*, and *anaſarca*.

END of LECTURE VII.

LECTURE VIII.

On inſenſible perſpiration; *ſpittings*; *vomitings*; *ſweatings*; *and hæmorrhagies.*

§ 913. VII. THE ſeventh claſs of ſymptoms, which is now to be conſidered, includes thoſe that happen in the INSENSIBLE PERSPIRATION.

§ 914. There may happen divers variations in the *quality* of the perſpirable matter, which we can never get the certain knowledge of, on the account that this evacuation, though continually making, is ſo little obvious to our ſenſes.

§ 915. There may poſſibly occur as many morbid alterations in the *quality* of the *matter perſpired*, as in the matter excreted by *urine*, or by *ſtool*, but we cannot ſee the different qualities in the perſpired matter, as we can the different qualities of the *urine*, and of the *ſtools*.

§ 916. NEVERTHELESS, I muſt obſerve, that a knowledge of the QUANTITY evacuated by *inſenſible perſpiration*, is in a great meaſure attainable.

§ 917. It may ſeem to ſome an impoſſible thing to get the knowledge of this point, without weighing all that a perſon takes into his ſtomach, and all that comes from him by the ſenſible evacuations; and without weighing the perſon *daily*: which laſt thing cannot be practiſed, at leaſt *not* with a patient under an acute diſtemper.

§ 918. We cannot deal with our patients as *Sanctorius* dealt with himſelf, and therefore we muſt not indeed expect to know to an ounce, how much the ſick perſon daily perſpires: but yet, without that method, we may learn whether the quantity excreted by *inſenſible perſpiration* is *too much*, or *too little*; whether it exceeds, or is deficient, in any conſiderable degree.

§ 919. And the knowledge hereof, as an happy light, will diſcover to the phyſician the way he ſhould take for curing his patient.

§ 920. The two chief vices in the inſenſible perſpiration are the following, viz.

1. An *Exceſs:*

2. A *Deficiency* in the quantity of the matter perſpired.

§ 921. I. Excess in the quantity of this evacuation. We may know this to be the caſe of the patient, if we find he loſes fleſh, while the *ſenſible* evacuations are no more than they ought to be; and while he takes a ſufficient quantity of aliment for repairing the daily waſte of the body, &c.

§ 922. The cauſes of this exceſs are a *laxity* of the perſpiratory *tubuli*, and too great a *tenuity* of the lymphatic fluid, &c.

§ 923. This ſymptom therefore foreſhews an *atrophy*, or a waſting of the body, if it be not removed.

§ 924. And the conſideration of the productive cauſes of it may convince us, that the proper remedies are thoſe medicines which may *inſpiſſate* the animal fluids, and thereby remove the *morbid quality* of them; and thoſe medicines which may recover the veſſels to their proper tenſeneſs.

§ 925. It may be of advantage to the ſick in this caſe, if the *air* of his chamber be rendered cooler, and if he be taken out of his bed, and ſit a while in his chair; and chalybeate medicines are proper remedies.

§ 926. II. The other ſymptom is a deficiency in the quantity excreted by *inſenſible perſpiration.*

§ 927. We may conclude that the quantity excreted this way is *too little*, if the body becomes *fuller*, *ſwelled*, or *bloated*, while the ſenſible evacuations are in their uſual due quantity; and while the uſual quantity of aliments taken into the ſtomach has not been increaſed.

§ 928. The productive cauſe of a deficiency in the quantity of this evacuation is either 1. ſome *viſcid* quality in the animal fluids, or 2. the particles of the matter of this excretion have not been ſufficiently comminuted, or rendered ſmall enough to paſs off through the perſpiratory *tubuli*.

§ 929. This ſtate of the animal fluids and of the matter of this excretion (§ 928.) is commonly owing to a *deficiency* in the ſtrength, or force of the action of the heart, and arteries, and lungs, &c.

§ 930. We may therefore conclude, that thoſe *alterative* medicines which may attenuate *viſcid* humours, and that thoſe *reſtorative* medicines which may ſtrengthen the action of the vital organs, and thereby promote the comminution of thoſe particles of the matter of perſpiration, which are too bulky for excretion, are the proper remedies.

§ 931. It is certainly of great importance to a ſick perſon, that not only the ſtate of the ſenſible evacuations be known, but alſo that of the *inſenſible* perſpiration; and the neglect hereof has occaſioned ſad *miſtakes*, and the giving medicines, which, inſtead of removing the diſtemper, have rendered the caſe much worſe.

§ 932. A patient of mine in Somerſetſhire had the advice of ſeveral who practiſed phyſick, and I may ſay, at leaſt, very unprofitably, through ſuch a miſtake.

§ 933. She was a young woman, aged about twenty-ſix years. She complained of a violent *pain* on one ſide of her head; of frequent and violent *ſtitches* in her ſides; and of great pain in her back, and a throbbing there, as ſhe expreſſed it: ſhe ſlept very little, was *hot*, and *thirſty*; and had no appetite to any food.

§ 934. She complained likewiſe of a great ſhortneſs of breath; and that her feet and legs were very much ſwelled; and that ſhe made *great quantities* of water, though ſhe drank but little.

§ 935. She had her *menſes* very *irregularly* as to time, *little* in quantity, and of a pale colour.

§ 936. I apprehended, that her diſorders were brought on by a *viſcid quality* of the animal fluids, a deficiency in the ſtrength of the vital organs, and thence an *inſufficient* excretion by the inſenſible perſpiration.

§ 937. And correſpondent to theſe ſentiments (beſides ordering a proper plaiſter to be applied to the nape of her neck) I preſcribed theſe following remedies.

℞ *Camphor.* ʒi. *ſp. vini rect.* ℥i. *aceti diſtillat.* ℥ſs. *m. f.* ERRHINUM *frequenter utendum.*

℞ *Sal martis Riverii* ʒiſs. *ſal prunell.* ℥ſs. *tartar vitriolat.* ℈i. *rad. curcumæ* ʒii. *nuc. moſcal.* ℈i. *ol. menth. ol. ſaſſafr.* āā *gut.* iii. *m. f. pulvis in ſexdecim partes æquales dividendus; quarum capiat unam veſperi et mane cum cochl.* i. *ſyr. de althæa miſtam ſuperbibendo cochl.* iv. *infuſi ſeq.*

℞ *Rad. valerian ſylveſt.* ʒii. *rad. ariſtoloch. rot. calami aromatic.* āā ℥ſs. *herbarum marrubii alb. heder. terreſtris* āā *manipulos duos. aq. font. vini alb.* āā ℥xx. *m. f. infuſum fervidum, et clauſum per horas tres, dein coletur liquor.*

℞ *Sp. aniſi volat. elixir proprietatis* āā ʒii. *cum ſemiſſe, tincturæ ſuccini volatilis, laudan. liq. Syden-*

hami ā ā ℥iſs. *et f. miſtura cujus capiat gut.* xxx. *in cyatho infuſi præſcripti, urgente dolore.*

Theſe medicines were repeated, and ſhe happily recovered her health.

§ 938. VIII. The eighth claſs of ſymptoms contains the *incidental evacuations*, viz. by SPITTING, VOMITING, SWEATING, and HÆMORRHAGES.

§ 939. I. The firſt EVACUATION I ſhall conſider is that by SPITTING.

SPITTING is not a natural evacuation; and in the time of perfect health we have it not, unleſs we voluntarily (by moving the ſalival glands, or by hawking) bring a humour into our mouths with an intention to ſpit it out; and in health we have no occaſion for it. Whenever it ſpontaneouſly happens, it is always the effect of ſome diſeaſe, either *chronical* or *acute*.

§ 940. Sometimes in diſeaſes it proves very beneficial, though the effect of a morbific cauſe; it does ſo when it ſerves as a *vicarious excretion*, carrying off morbid humours where they are very abundant, as in the *confluent* and higher degrees of the *diſtinct ſmall-pox*.

§ 941. And therefore it is not in ſuch caſes to be ſtopped, but promoted, while there are morbid humours in the blood, which needs to be excreted from it by every way of evacuation.

§ 942. SPITTING is an evacuation of *lymphatic* humours, excreted from the blood partly by the *ſalival* glands, which empty their fluid into the mouth, and partly excreted by lymphatic arteries, which empty their fluid into the cavities of the lungs; and which excreted lymph, by expectoration, with the air expired, is brought into the mouth, and ſpit out.

§ 943. The productive cauſes of this ſymptom (whether it happens in *chronical* or *acute* diſeaſes) are two, viz. 1ſt, A greater *thinneſs* of the animal fluids, eſpecially of the *lymph*, than in the time of health; and, 2d, A *laxity* of the veſſels: becauſe this evacuation could not happen, if the blood and lymph were very *viſcid*; and the veſſels and glands ſecreting the lymph were *rigid*, or were not more lax than in time of health.

§ 944. Therefore, when this ſymptom occurs, we know *by it*, in a great meaſure, the *quality* of the animal fluids, and the ſtate of the ſolids.

§ 945. The conſideration of theſe things may ſatisfy us, that when this ſymptom happens in *chronical* diſorders, and is *exceſſive*, or continues without any advantage to the patient, we ſhould for the cure of it preſcribe thoſe *alterative* medicines which may *inſpiſſate* the blood, &c. and thoſe *reſtorative* medicines, which may remove the *laxity* of the veſſels, recover their natural tenſeneſs, and leſſen their diameter.

§ 946. When this evacuation occurs in FEVERS, particularly in the *ſmall-pox*, though it is from the cauſe of this diſeaſe, yet it is a good ſign, if it is not exceſſive, and does not continue too long; and it very much encourages us to hope for the patient's recovery.

§ 947. We may well rejoice when it occurs in *variolous* caſes, &c. With regard to which

§ 948. There are two things in the *ſmall-pox* to be regarded, viz.

1. The abatement of this diſcharge too ſoon.
2. The total ceaſing of it too ſoon.

§ 949. 1. The abatement of this diſcharge, which ſhews an increaſing *viſcidity* of the animal fluids, which renders this excretion *thick*, *viſcous*, and *glutinous*; ſo that it is with great difficulty that the patient raiſes and diſcharges the viſcid phlegm.

§ 950. It is requiſite for continuing and increaſing this *vicarious* evacuation, to preſcribe thoſe *alterative* medicines which may remove the *viſcous* quality of the animal fluids, &c. and ſtrengthen the veſſels, &c.

§ 951. 2. The total ceaſing of this evacuation in the *ſmall-pox* too ſoon is more threatening, as it is the effect of the ſame cauſes ſubſiſting in a greater degree, viz. the increaſe of the fever, and vital heat, cauſing to perſpire the thinneſt parts of the *blood* and *lymph*, and *inſpiſſating* the animal fluids, and thence obſtructing the lymphatic veſſels and glands.

§ 952. The curative indications are the ſame in both caſes, and the ſame medicines are the proper remedies.

§ 953. *Nitrous*, *ſaline*, and *acid* medicines are proper to render the animal fluids thinner, and this evacuation more copious; and to recover it when it is ſtopped, &c.

§ 954. I would obſerve, that, in the *ſmall-pox* and other acute fevers, this ſymptom generally ceaſes, when the diſeaſe is drawing to a happy period; that is, when the blood and lymph return to their natural conſiſtence, and the ſanguine and lymphatic veſſels recover their natural tenſeneſs, &c.

§ 955. There is another evacuation of a *watery humour* by the mouth, which may be referred to the head. This is vulgarly called the WATER-SPRINGS, which is a copious flow of a water, or of a watery humour, into the mouth.

§ 956. This riſes immediately from the ſtomach; but the humour is excreted or ſeparated from the blood, either by the *miliary glands* ſituated in the membranes of the ſtomach, or by the *pancreas*; on which account it is in reality a ſort of a *diarrhœa* from that large conglomerate gland, or from the miliary glands mentioned.

§ 957.

§ 957. If it ſhould be aſked, how ſuch a quantity of a watery humour (ſuppoſing it ſecreted by the *pancreas)* comes to aſcend up into the ſtomach? I would anſwer, that it may be done by the membraneous coats of the *duodenum* contracting to the *axis* of it. This humour is often brought up from the ſtomach into the mouth without vomiting, which cannot be done otherwiſe than by the contraction of the coats of the ſtomach, gently ſqueezing the humour upwards into the *œſophagus*, and by a ſimilar action of the coats of the *duodenum*, it may aſcend from the *pancreas* into the ſtomach: but it is not material to determine certainly by what *glands* the humour is ſecreted from the blood.

§ 958. This evacuation reſults from too great a *thinneſs* of the *lymph* ſecreted from a *thin*, *watery* blood, by the ſecreting *tubuli* of the *miliary glands*, or of the *pancreas*, whoſe diameter, by means of a *laxity* of them, have been too much enlarged.

§ 959. For ſuch a flux of lymphatic fluid could never happen, if the blood was not in a more *watery* ſtate, and the *lymph* thinner, and the ſecreting veſſels more *lax*, than in the time of health.

§ 960. This ſymptom, therefore, when it occurs, ſhews what is the ſtate of the animal *fluids* and *ſolids*, and what we ought to do for removing it.

§ 961. And thoſe *alterative medicines* which may remove the too great tenuity of the fluids, and bring them to their proper conſiſtence, and recover the ſolids to their natural tenſeneſs and ſtrength, are the proper remedies.

§ 962. For this purpoſe the *balſamum reſtringens* is proper, or one or other of the following medicines, viz.

℞ *Limaturarum ferri, lapid. hæmatitis pparati.*
Rad. ſerpentar. virg. ā ā *gr.* v.
Conſerv. cortic. aurant. ℥ſs.
Syr. balſamic. q. ſ. m. f. bolus, bis terve in die ſumendus quamdiu fuerit occaſio. Vel,

℞ *Sal martis, gr.* iii.
Boli Angliæ, gr. vii.
Nucis moſcatæ, ℈ſs.
Conſerv. roſarum rubrarum, ℈i.
Syr. de roſis ſiccis, m. f. bolus ut prior ſumendus.

§ 963. II. The next evacuation is that by VOMITING. I am ſpeaking now of ſpontaneous vomitings ariſing from internal cauſes, not of thoſe which are forced by *emetic* medicines.

§ 964. VOMITING is a convulſive motion of the ſtomach and *æſophagus*, and of the abdominal muſcles, by which the ſtomach, with the *pylorus* ſhut, and its bottom and ſides contracted upwards towards the orifice on its left ſide of the body through which the aliments paſs into the ſtomach from the *æſophagus*, and being ſtrongly compreſſed by the convulſive contraction of the abdominal muſcles, does with violence expel its contents through the mouth out of the body, &c.

§ 965. This ſymptom occurs both in *acute* and *chronical* diſeaſes, and likewiſe on many incidental occaſions.

§ 966. Here it may be obſerved, 1. That the natural contractile motion of the muſcular fibres and membranes of the ſtomach is towards the *pylorus*, or its orifice ſituated in the right ſide of the body, through which the contents of the ſtomach paſs into the *duodenum* downwards.

§ 967. 2. That whatever checks or retards the natural contractile motions of the fibres, and membranes of the ſtomach towards the *pylorus*, produces that uneaſy ſenſation which we call *loathing*, or ſickneſs at ſtomach.

§ 968. 3. That whatever produces an *inverted* motion of the ſtomach, and *œſophagus* upwards, produces a vomiting.

§ 969. 4. That vomiting is produced by the ſame cauſe which excites a loathing, or ſtomach ſickneſs, when that cauſe ſubſiſts in a greater degree; that is, when the *ſtimulus* is ſtronger.

§ 970. I ſhall conſider this evacuation as a ſymptom of *acute* diſeaſes; and I may ſay, that it frequently happens in the beginning of *intermitting*, *remitting*, and *continual* FEVERS, and indeed in moſt ſorts of fevers, whether contagious or not.

§ 971. The productive cauſes of this ſymptom are either, 1. *Acrid* ſtimulating particles conveyed into the ſtomach with the aliments.

§ 972. This often may be the caſe, when contagious diſtempers are rife, and perſons eat their food in rooms where the air of them is replete with infectious particles.

§ 973. Or, 2dly, this ſymptom may be brought on by *acrid* ſtimulating particles ſecreted from the blood by the glandules ſituated in the membranes of the ſtomach, and evacuated into it.

§ 974. The ſtimulating particles, which produce vomiting in different ſorts of fevers, may have a different figuration, or texture; as the particles of different kinds of *emetic* medicines have, though they produce the ſame effect of *vomiting*, when taken into the ſtomach in a ſufficient quantity.

§ 975. When this ſymptom happens in the beginning of fevers, there are two ways for the relief of the patient, viz. 1. To promote the diſcharge of the ſtimulating matter *upwards* by giving a gentle *emetic*, e. g. the *rad. ipecacoanhæ*, or the *vinum ipecacoanhæ*, or by the patient's drinking a ſufficient quantity of a ſtrong infuſion of *green tea*, or of *carduus benedictus*, or of warm water, to procure three, or four, or five fits of vomiting.

§ 976. This method is moſt adviſeable, when there is reaſon to apprehend the coats of the ſtomach to be covered with a viſcous phlegm, and that no ill effect is like to follow the violent *concuſſions* of the body, which commonly attend the operation of vomiting.

§ 977. We prevent by this method the matter productive of this ſymptom from deſcending into the inteſtines, and preſſing with the chyle into the blood, which might increaſe the fever.

§ 978. But, 2. There is another way of relief; and that is, to change the figure of the ſtimulating particles, deſtroying their morbid quality. This may effectually be accompliſhed by ſuitable *alterative* medicines, as I have many times found in my own experience.

§ 979. And this method is moſt proper in very tender bodies, that cannot bear the violent ſhocks of vomiting.

§ 980. And I may add, that thoſe medicines which alter the figure of the ſtimulating particles, and take off the vomitings, and ſickneſs of the ſtomach, do likewiſe ſecure the patient from harm by thoſe *particles* paſſing onwards to and through the lacteals into the blood.

§ 981. As for that vomiting which happens in the progreſs of the fever (and the ſame may be ſaid as to *nauſeas*, ſick fits, &c.) the moſt proper and gentle method is, in my opinion, to endeavour altering the *quality* of the ſtimulating matter contained in the ſtomach.

§ 982. For this purpoſe the following medicines are proper, and have been very effectual, *viz.*

℞ *Sal abſinth.* ʒi. *ſucc. limon.* ℥iſs. *m. et efferveſcentiâ finitâ, adde aq. menth. vulg. ſimpl.* ℥iii. *aq. cinnamom. ſpirituoſ.* ℥iſs. *pulv. e chel. cancr. ſimpl.* ʒi. *et f. miſtura ſine ſaccharo, cujus capiat cochl.* ii. *ut opus fuerit contra ventriculi ægritudines, poſt phialæ agitationem. Vel,*

℞ *Sal abſinth.* ℥i.
Aq. cinamom. ſimpl. ℥ii.
Aq. nuc. moſchat. ℥i.
Sp. nitri dulcis, gut. lx.
Sacchar. alb. q. ſ. ad ſaporem gratum, m. f. julepum, ut miſtura prædicta ſumendum.

§ 983. I would now mention ſome particulars in relation to this ſymptom, as occurring in *acute* diſeaſes, viz.

1ſt Obſervation. That in fevers, when the vital organs are excreting the morbid humours through the ſubcutaneous veſſels, in the form of any eruption, we ſhould *not* endeavour to remove this ſymptom by *emetic* but by *alterative* medicines: becauſe the operation of an *emetic* makes a REVULSION from the outward ſuperficies of the body *ad intra*, and occaſions a return into the blood of humours which were in the courſe of being carried out of the body; which return of humours may heighten the diſeaſe.

§ 984. And therefore the method of *emetic* medicines is very improper in all *eruptive* fevers.

§ 985. Obſ. 2. That we ſhould *not* attempt to remove the ſymptom in fevers attended with the *inflammation* and tumour of any particular part; as in *pleuriſies*, *peſtilential* fevers with *buboes*, &c. The reaſon of this caution is the ſame with that mentioned (§ 983.) viz. the *revulſion* that is made by ſuch medicines, and the conſequent return of morbid humours into the blood; and thereby, a putting the life of the patient into greater hazard.

§ 986. For this reaſon Dr. FRIEND diſapproved of giving *vomits* in the *ſmall-pox*, ſaying, "Cum "nulla prorſus medicina humores potentius avertat, quam quæ vomitum ciet, cujus ſane in "revellendo vis ex hoc ſatis intelligitur, quod "ſcilicet coxarum dolores, atque œdemata ſæpius "expugnet, aliis fruſtra, diuque tentatis revellentibus." *Comment.* p. 41, 42.

§ 987. He alſo obſerved, that for this reaſon the moſt ſkilful and judicious PHYSICIANS forbid *emetics* when a *criſis* is near, as the moſt experienced SURGEONS prohibit them, and all other *evacuations*, when any tumour is tending to ſuppuration.

§ 988. The Doctor ſpeaks with warmth againſt this ſort of medicine in *pleuriſies*, ſaying, "Quid "enim de iis cenſendum eſt qui in *pleuritide*, "v. gr. contra Celſi præceptum, *vomitoria*, eaque "valentiſſima præſcribunt? quaſi unquam vehemens illa lateris contentio, quæ inter vomendum "oritur, morbum levaret! imo augeat neceſſe "eſt, &c." *Comment.* p. 41.

§ 989. If this ſymptom of vomiting happens to a patient under a *chronical* diſtemper, you are to conſider whether his diſtemper was produced by, or depends on, any obſtructions of long continuance; becauſe if it does, we ſhould endeavour to remove it by proper *alterative* medicines, not by *emetics*, on the account that they will rather increaſe ſuch obſtructions, &c.

§ 990. Sometimes VOMITING is brought on by violent pains of the head, or by inflammation and violent pain of the bowels, as in the *cholic*, the *iliac paſſion*, and fits of the ſtone, &c. and in ſuch caſes the vomiting is ſymptomatical, and to be removed by curing the primary diſeaſe.

§ 991. III. Another incidental evacuation is that by SWEATING. Here I muſt obſerve that *ſweating* is not a natural evacuation, and never happens without ſome adventitious cauſe.

§ 992. Exercise and the heat of the weather will oftentimes produce ſweat in healthy bodies.

§ 993. But in bodies under ſickneſs it is either *ſpontaneous*, or the effect of ſome methods or medicines uſed to procure it.

§ 994. The evacuation by SWEATING, now under my conſideration, is that which I call *ſpontaneous*, and is the effect of thoſe cauſes which produced the diſeaſe of which it is a ſymptom; and it is only the conſequence of the ſtate of the fluids and ſolids, or veſſels of the patient, and of the action of the vital organs.

§ 995. This evacuation by SWEAT (§ 994.) may reſult from very different cauſes, and conſequently may have different qualities and ſignifications, and different curative indications; and accordingly require different remedies, and different methods of cure.

§ 996. I ſhall therefore take notice of the principal of them, viz. 1. Of SWEATS that are *moderate* in quantity, *warm*, and *univerſal* from all parts of the body; and attended with a regular and an equal pulſe, and an abatement of the febrile heat, and with relief to the ſpirits of the patient: this is a good ſign, though a morbid ſymptom, &c.

§ 997. It ſhews that there has been obtained a happy *alteration* of the morbid quality of the animal fluids, and a comminution of the morbid particles; and that there is a good force in the action of the vital organs for excreting them from the blood, and expelling them out of the body; and for bringing the fever to the deſired period.

§ 998. This ſort of ſweat indicates the propriety of continuing the uſe of thoſe temperate medicines and methods which have contributed to the bringing the diſtemper ſo near its concluſion, &c.

§ 999. 2. Thoſe *ſpontaneous* SWEATS, which are *profuſe* or exceſſive in quantity, and of a long continuance. This proceeds from a too great thinneſs of the animal fluids, produced commonly by *diſſolvent* particles diffuſed in them, and partly from a *laxity* of the veſſels.

§ 1000. We may from this ſymptom know that the diſeaſe of the patient is attended with danger; and that there is a neceſſity of preſcribing ſuch *alterative* medicines as may free the blood from its *diſſolvent* quality; and ſuch *reſtorative* medicines as may recover the veſſels to their natural tenſeneſs, and maintain the vital ſtrength, &c.

§ 1001. 3. *Colliquative* SWEATS are another ſort to be conſidered.

I call thoſe ſweats *colliquative*, which are much in quantity, feel *greaſy* and *clammy*, and are attended with a *quick* and *weak* pulſe, a *waſting* of the fleſh, and loſs of ſpirits and ſtrength.

§ 1002. Theſe ſweats diſcover to us, that the fever was produced by *diſſolvent* cauſes, and that the ſubcutaneous veſſels are very *lax*; and that there is in ſome meaſure a *ſolution* of the component parts of the animal fluids, and an excretion from the body, not only of morbid humours, but alſo of nutritious.

§ 1003. This ſymptom therefore ſhews that the life of the patient is in imminent danger, and indicates the neceſſity of preſcribing the like remedies which were proper for removing the laſt-mentioned ſymptom.

§ 1004. 4. *Cold* SWEATS in *acute* diſeaſes need our conſideration.

If a SWEAT be *univerſal* and *clammy*, and attended with *coldneſs* of the fleſh, it diſcovers that the ſecretion of the nervous fluid is vaſtly *deficient* in quantity; and that the force or vital ſtrength is ſo much abated, that the heart cannot ſufficiently propel the blood through the capillary arteries; it ſhews that the *viſcidity* of the blood, and lymph, and *laxity* of the veſſels dreadfully increaſe.

§ 1005. This ſymptom therefore ſhews the patient to be in extreme danger, and indicates the neceſſity of adviſing, with proper *alterative* remedies, ſuch *warm* and *reſtorative* medicines, as may revive and increaſe the vital heat, and ſtrengthen the action of the heart and other vital organs, and increaſe the ſecretion of the *nervous* fluid; ſuch as may raiſe the pulſe, and recover if poſſible the veſſels to their natural TONE.

§ 1006. 4. *Partial* SWEATS are to be conſidered. I call thoſe SWEATS *partial*, which iſſue only from ſome particular part of the body, e. g. from the *head*, and *neck*, the other parts of the body remaining very dry; and the pulſe at the ſame time being *quick* and *weak*, and the fleſh *cold*.

§ 1007. This is a very terrible ſymptom: it is produced by an increaſed *viſcidity* of the animal fluids; by an increaſed obſtruction of the ſubcutaneous veſſels, and by a diminution of the vital heat and ſtrength; and if it be attended with a *dry tongue*, and a *quick* or difficult reſpiration, it ſhews that death is not far off, &c.

§ 1008. The curative indications are much the ſame as in the laſt-mentioned particular, and the like remedies are needful.

§ 1009. IV. The fourth *incidental* EVACUATION is that by HÆMORRHAGIES.

An HÆMORRHAGE is a flux of blood from any part of the body; and in diſeaſes it reſults from the cauſe which produced the diſeaſe of which it happens to be a ſymptom.

§ 1010. This evacuation (§ 1009.) is moſt frequently made from the noſtrils, or with the urine, or with the ſtools, or in female bodies ſometimes from thoſe veſſels which evacuate the menſes.

§ 1011. I have already conſidered HÆMORRHAGES from the *noſe*, and by *urine*, and by *ſtool*, as to their cauſes, ſignifications, and curative indications, and from the like cauſes proceeds the evacuation of blood in women through the veſſels which diſcharge the *menſes*, when this flux happens in fevers between the ſtated periods.

§ 1012. I ſhall not repeat what has been delivered, but only that when this evacuation happens to perſons under *acute fevers*, it will be prudent to take notice of the ſtate of his *pulſe*, of the degree of the febrile *heat*, and of the condition of the veſſels.

§ 1013. If in a perſon under a *fever* attended with an *hæmorrhage*, we find his PULSE *quick* and *weak*, and the heat of his body *moderate*, and the veſſels *lax* (which we may pretty well know by *feeling* his fleſh) we ſhould conclude that the flux of blood was produced by *diſſolvent* cauſes, and to preſcribe accordingly, &c.

§ 1014. *Spontaneous* HÆMORRHAGES, when a *diſſolvent* quality ſubſiſts in the blood, occurring in diſeaſes, whether *acute* or *chronical*, as I apprehend it, proceed from the ſame cauſes, viz. a *comminution* of the globules of the blood, and a *relaxation* of thoſe veſſels through which the blood flows out of the body.

§ 1015. For while the globules of the blood retain their natural, healthy bulk, and the diameter of none of the animal veſſels is enlarged, it ſeems a thing impoſſible for blood to flow out of the body.

§ 1016. It deſerves notice, that no *hæmorrhage* proceeds immediately from any *ſanguine artery*, as we may conclude from the *equable* manner of the blood's flowing when an *hæmorrhage* happens; whereas if it came immediately from an *artery*, the blood would come out of it by *leaps*, as it does when an artery is wounded.

§ 1017. And as I once ſaw it in a *leather-parer* at *Yeovil* in *Somerſetſhire*, who happened (at his work) to cut off a very ſmall part of the tip of his *noſe* with his *paring-iron*.

§ 1018. He had loſt a great deal of blood from the cutting of the extremity of an *artery*, which occaſioned my being ſent for; and I ſaw the blood as if ſquirted out by every contraction of the artery.

§ 1019. And the reaſon why *hæmorrhages* do not happen immediately from any of the arteries may be this, viz. that their coats are much thicker than the coats of any other of the animal veſſels.

§ 1020. Here a QUESTION may be put, how a *hæmorrhage* ſhould happen from any of the *veins*, ſince they continually grow wider and wider, till they run into the *vena cava*.

§ 1021. This difficulty inclines me to think that the blood which flows out of the body does not come from the veins, but paſſes from the adjacent capillary arteries through the lymphatic arteries, which go off from thoſe ſanguine arteries, and are much *relaxed*; and the globules of the blood, having been by diſſolvent cauſes *comminuted*, do therefore eaſily paſs through them *extra corpus*.

END of LECTURE VIII.

LECTURE IX.

On various Sorts of Pains.

§ 1022. IX. THE next claſs of ſymptoms comprehends the various ſorts of PAINS. But in order to a right underſtanding of the ſeveral particulars belonging to this claſs, it is requiſite that we form true notions of the CAUSES by which pains are produced.

§ 1023. The cauſe commonly aſſigned is the *ſtretching* ſome nerve beyond its natural eaſy tenſion.

Doctor BLANCARD aſſigns this as the occaſion of pain, ſaying, "Dolor eſt ingrata perceptio in "mente orta, quod nervus, ex cerebro originem "habens, tam validè per cauſas diſtendatur, ut "periculum ruptionis incurrat." Vide ejus Lexicon Medicum.

§ 1024. This is the only cauſe aſſigned by Doctor BOERHAAVE (aph. 220 where he ſays), "Si fibra "nervoſa cerebro orta, ita extenditur, ut diſſo-"lutionem minitetur, fit doloris idea."

§ 1025. Theſe phyſicians were very right in aſcribing the ſenſation of pain to ſome nerve that has its riſe from the *cerebrum*, or greater brain; becauſe the nerves which have their riſe from the *cerebellum*, and terminate in parts remote or diſtant from the *ſenſorium commune*, cannot be the means or inſtruments of conveying any ideas or ſenſations to the common ſenſory, and thereby to the mind of a perſon.

§ 1026. And I was of the ſame opinion with the phyſicians mentioned (§ 1024.) concerning the cauſe of pain, *till* (in after-conſideration of the ſtructure and œconomy of human bodies) ſome reaſons occurred to my thoughts againſt it.

§ 1027.

§ 1027. I conſidered, 1. That the nerves are like ſo many threads; that they are long, and exceedingly minute, cylindrical *tubuli*, ariſing out of the brain, and terminating in one or other part of the body.

§ 1028. 2. That the nervous threads, or *tubuli*, are not made ſo tight as the ſtrings put to a fiddle, none of which can be relaxed or contracted to a certain degree, without putting that muſical inſtrument out of tune: but all the nerves, and other veſſels in the body, have, from the all-wiſe Creator, ſuch *lengths* between their beginnings and endings, that none of the contractions or extenſions of the limbs or muſcles, in any kind of bodily labour or exerciſe, do produce pain. A man in health may walk, run, ſtoop, and perform a vaſt variety of actions with eaſe; but under many diſeaſes he ſuffers pain, though all his muſcles and limbs are in a poſture of reſt.

§ 1029. The conſideration of theſe things made me to doubt whether pain is produced by any ſtretching of the nerves.

§ 1030. And then when I conſidered that every other *ſenſation* is performed by means of impreſſions made on the extremities of the nerves of the *other organs* of ſenſe, I concluded that all PAIN is excited by ſome action on the extremities of the nerves by which we feel.

§ 1031. And after a cloſe and impartial reſearch into this matter, it appeared to me, that there are two general *proximate* cauſes of PAIN, viz.

I. Too great a *preſſure* againſt the extremities of the nerves affected; or,

II. The *immediate contact* of ſome *acrid* or other ſolid, hard particles, with the extremities of any of the nerves by which we *feel*.

§ 1032. I ſay *with the extremities of the nerves* by which we feel, 1ſt, Becauſe there are nerves by which *we do not feel*, though they ariſe from the *cerebrum*, e. g. we do not properly feel by the *olfactory nerves*, nor by the *guſtatory nerves*, nor by the *auditory nerves*, nor by the *optic nerves*. 2d. Becauſe there are multitudes of nerves, as we have reaſon to think, incapable of any SENSATION, conſequently incapable of FEELING, or ſuffering PAIN: I mean all the NERVES which ariſe in, and go off from, the *cerebellum*.

§ 1033. There is this obvious, and (I think) convincing argument for the truth of this opinion, viz. that no ideas or ſenſations can be conveyed to the common SENSORY (which is ſeated in the greater brain, and where the ſoul or immortal ſpirit of a man has its reſidence) I ſay, that no ideas or ſenſations can be conveyed to the common SENSORY by means of the nerves ariſing from the *cerebellum*; becauſe they have no connection with the greater brain.

§ 1034. The *cerebellum* is the *terminus a quo*, the part from which theſe nerves do ariſe; and parts diſtant from the greater brain are the *terminus ad quem*, or the parts to which they paſs, and where they end.

§ 1035. And it is plainly a wiſe contrivance of our great Creator, that the nerves, which ſupply the vital parts of the body, and ſubſerve the vital functions, ſhould be *inſenſible*: for if it was otherwiſe, various little incidents might fatally diſturb the animal œconomy, and render the vital operations very difficult, and bring life ſooner to a period.

§ 1036. I. I have mentioned as one general cauſe of pain, a *too great* PRESSURE from external cauſes againſt the extremities of the nerves affected; it will be proper therefore for me to ſhew you, 1. That too great a preſſure againſt the extremities of the nerves by which we feel, will excite pain. 2. What *internal* cauſes may produce painful preſſures.

§ 1037. 1. To ſhew you, that *too great a* PRESSURE from external cauſes againſt the extremities of the nerves by which we feel, will excite pain. This will appear evident, if we conſider, how certainly we can produce pain by PINCHING any part of the body; ſince in that action it is the preſſing the extremities of the nerves that is the cauſe of the pain.

§ 1038. The PAINS alſo which follows upon laying too great a weight on any part of the body, and thoſe which are produced by ſtriking any part of the body with a rod, or ſtick, are further proofs of this point.

§ 1039. The actions of *pinching* and ſtriking any part of the body, make a violent preſſure againſt the extremities of the nerves in thoſe parts; but make no *elongation* of the nerves affected, but rather the contrary.

§ 1040. Such an action is not like pulling a ſtring that is faſtened at the other end; but if ſuch an action did in ſome meaſure ſtretch the nerves affected, it would not follow that the pain was the effect of that ſtretching.

§ 1041. It is certain that the moſt *gentle* PRESSURE of any acrid or hard matter againſt the extremities of the feeling nerves, made *naked*, will excite the moſt exquiſite pains; and though the *epidermis*, and the other covering membranes, (viz. that of the *inner* ſuperficies) ſecure the nerves from ſuffering pain by gentle *preſſures* on the *outſide* of ſuch membrane; yet, in my apprehenſion, it is eaſy to conceive how any violent preſſure againſt the feeling nerves may excite pain, notwithſtanding their covering membrane, becauſe that is very thin.

§ 1042. 2. To ſhew what *internal* cauſes may produce painful preſſures againſt the extremities of the feeling nerves: and I think the following particulars may be juſtly aſſigned, viz.

§ 1043. 1. Viscid humours in the blood, or particles diffuſed in it, *too bulky* to paſs eaſily through the capillary ſanguine arteries; for theſe cauſes will obſtruct them, that is, they will occaſion a ſlower motion of the blood through them than ought to be.

§ 1044. Hence it happens, that the blood coming from the larger arteries into the leſſer, faſter than it can run off into the capillary ſanguine veins, muſt diſtend thoſe capillary arteries more or leſs, as the cauſe diſtending them is greater or leſſer; and conſequently may occaſion too great a preſſure againſt the extremities of the feeling nerves terminating in the coats of thoſe capillary ſanguine arteries, the perception of which is pain.

§ 1045. In theſe caſes, the coats of the diſtended capillary arteries, that is, the nerves terminating in them, is the ſeat of the pain.

§ 1046. And thus globules of blood impelled into *lymphatic* arteries will greatly diſtend them, and may occaſion a painful preſſure againſt the extremities of the adjacent nerves: but this is the caſe only when the part affected is attended with inflammation.

§ 1047. 2. The preſſure of *ſome adjacent increaſing tumour* may produce the ſame effect.

§ 1048. 3. Elastic air, or *wind* (I uſe the terms as ſynonymous) may be aſſigned as another, and indeed a very frequent, cauſe of a painful preſſure againſt the extremities of the feeling nerves.

§ 1049. I mean by *elaſtic air*, thoſe particles of air which are at liberty, or in a ſtate capable of exerting their *elaſtic* force; to diſtinguiſh them from air which is not in ſuch a ſtate: for the *air*, which conſtitutes the greateſt part of the human *calculus*, and the air in wood, and in moſt other ſolid bodies (while its particles are cloſely combined and united with the other parts of thoſe bodies) is not capable of exerting its *elaſticity*; that is, it cannot expand itſelf, or produce any effect on other bodies by that *elaſtic quality* which is inherent in it; and therefore, by way of diſtinction, may be called *unelaſtic* air: or, at leaſt, it is what I mean by that expreſſion.

§ 1050. Now, that *elaſtic air* may produce painful preſſures againſt the extremities of the *feeling* nerves, we may very juſtly infer from the ſtate of things in *flatulent cholics*.

§ 1051. In theſe caſes, the *elaſtic air*, in proportion to its quantity, and the degree of its *elaſtic* force, diſtends the affected inteſtines, and preſſes againſt all its membranes, veſſels, nerves, and fibres, which compoſe them.

§ 1052. *Elaſtic air* is likewiſe very often the cauſe of pain in the ſtomach, no leſs than in the bowels: and this indeed is the cauſe of pain in all diſeaſes, where the pain immediately ceaſes on the removal of the preſſure by the diſcharge of wind.

§ 1053. II. The *immediate contact* of any *acrid*, ſharp-pointed, or ſolid, hard particles with the extremities of the *feeling* nerves, is another kind of the proximate cauſes of pain.

§ 1054. The truth of this (§ 1053.) will be evident, if we conſider, that by paſſing the point of a needle or lancet, or the *ſpicula* of ſtinging nettles, through the *epidermis*, and bringing them to a contact with the extremities of the nerves, will excite exquiſite pain.

§ 1055. The pain which follows upon the application of bliſtering-plaiſters proves the ſame: for as ſoon as the pungent particles of the *cantharides* paſs through the *epidermis*, and come to a cloſe contact with the extremities of the nerves, painful ſenſations enſue.

§ 1056. Let us therefore inquire, whether by the force of *internal* cauſes, any *acrid*, or ſolid, hard particles may be brought to an immediate contact with the extremities of the *feeling* nerves: and that they may, will be evident, if we conſider the ſtructure of the *external* ſuperficies of the body; and that, as under the *epidermis*, there are the extremities of the nerves of that *ſuperficies*, ſo there are likewiſe the endings of the *ſudatory* veſſels, and of the emiſſary ducts of numberleſs ſubcutaneous *glandules*; and that by theſe, various ſorts of particles may, and almoſt conſtantly do paſs off from the blood.

§ 1057. *Saline particles* certainly do ſometimes paſs off this way in great quantities; as we may juſtly conclude from the ſalt taſte which ſometimes happens in the ſweat of perſons.

§ 1058. This likewiſe proves, that any other ſort of *acrid* particles of the ſame minuteneſs may paſs off, or be excreted from the blood the ſame way.

§ 1059. Now when ſuch excreted, acrid, or ſolid particles happen to be *too bulky* to paſs through the pores of the *epidermis*, they muſt come to an immediate and cloſe contact with the extremities of the next adjacent nerves, eſpecially if protruded by other particles excreted from the blood through the ſame *tubuli*.

§ 1060. Thus it happens in cutaneous diſtempers, when they are produced by internal cauſes: thus it happens in *eryſipelatous* and *tettery* eruptions; the *acrid* particles, (many of which) *too big* to paſs through the *epidermis*, are with ſome *lymph* extruded from the ſubcutaneous excretory ducts, and after them others, till little *moleculæ* are formed; which increaſing (and ſpreading *quaquaverſum)* ſome particles are brought to immediate contact with the extremities of ſome nerves, and excite the ſenſations of *itching* (one ſpecies of pain, as it is an uneaſy ſenſation) or a ſmarting, more or leſs acute, and more or leſs in quantity.

§ 1061. This may lead us to apprehend how *acrid* particles may be excreted from the blood, and brought in like manner to an immediate contact with the extremities of the feeling nerves of the internal *ſuperficies* of the *oeſophagus*, ſtomach, and inteſtines, and truly in any other part of the body, and there produce pain: for if ſuch particles are excreted from the blood in any parts of the body, and cannot paſs through the pores of their covering membrane, they muſt ſtick between the endings of ſuch excreting *tubuli* and their *membranous* covering; and by the acceſſion of other ſuch particles, protruding them, be brought to contact with the extremities of the next adjacent *feeling* nerves, and occaſion pain, more or leſs, according to the *quantity* and *quality* of ſuch extravaſated particles.

§ 1062. There is another way in which particles of any kind may be brought to an immediate and *painful* contact with the extremities of the feeling nerves of the internal *ſuperficies*, viz. by a corrosion of their covering membrane.

§ 1063. Thus when any part of the membrane which covers the internal *ſuperficies* of the mouth, *oeſophagus*, ſtomach, or inteſtines, happens to be corroded, or fretted away; and the endings of the ſubjacent nerves are made naked, they are then expoſed to immediate contact with every thing that paſſes by them.

§ 1064.

§ 1064. This may be the caſe in ſome pains of the ſtomach and bowels; and we have reaſon to think it is ſo in INFANTS, when they have the *aphthæ*, eſpecially in that degree which nurſes call the *thorough-thruſh:* this is, when ſuch excoriations are produced in the membranes of the *oeſophagus*, ſtomach, and inteſtines, as appear in the mouth of the infants; the like of which may happen in adult bodies.

§ 1065. Such *ulcerations* or excoriations prove, that *acrid* or corroſive particles may be, and ſometimes are excreted from the blood by miliary glandules, and brought to an immediate contact with the extremities of the nerves in the parts affected with pain.

§ 1066. I muſt alſo obſerve, that not only *acrid*, but many other hard or ſolid particles, immediately touching the extremities of the *feeling* nerves, may likewiſe produce pain.

1067. Thus it happens when the *epidermis* in any part of the body is rubbed off, or by any means ſo ſeparated from the *cutis*, that the endings of the nerves lie naked: then even ſolid particles, (though not ſharp-pointed) by contact with ſuch nerves, will excite pain, as may be proved by touching ſuch nerves with the end of a blunt probe.

§ 1068. I apprehend that it appears manifeſt, from what has been ſaid, that the real CAUSES of pain are very different from what has been generally aſſigned.

§ 1069. Indeed, if pain was produced only by a *too great ſtretching of the nerves*, according to the common opinion, the method of cure would conſiſt only in removing that which produced ſuch a ſtretching of them, and in contracting them to their proper lengths. But

§ 1070. It has been ſhewn by *experiments*, that the NERVES have no *contractile* force, or innate power to contract themſelves, as the arteries and veins and other animal veſſels have; and likewiſe, that they cannot be extended or ſtretched as other animal veſſels may: that if a nerve is pulled with force, it will ſnap and break (like a hair that breaks by pulling it) but not be increaſed in its length.

§ 1071. And I may obſerve, that it has *not* been proved to be FACT, that any internal cauſes can ſtretch the nerves at all; much leſs occaſion ſuch frequent and ſuch continued ſtretchings of many of them, as would be neceſſary to the production of ſo many, ſo frequent, and continued pains as afflict many human bodies.

§ 1072. There is one thing more which I think may, with ſome probability of truth, be aſſigned as another cauſe of pain; and that is, *acrid* particles ſecreted by the brain with the *ſuccus nervoſus*, and evacuated by the nervous *tubuli*, which for a while adhering to the extremities of the nerves, excite painful ſenſations in them.

§ 1073. For although the ſecreting *tubuli* of the brain are extremely minute, yet we may conceive *acrid* particles exiſting in the blood minute enough to be admitted into them, and with the *ſuccus nervoſus* to be propelled into the nervous *tubuli*, and paſs onwards with it; which, when they come to the extremities of thoſe *tubuli*, and ſtick there, and are accumulated by the acceſſion of others, do produce *pain*, till by ſome means or other they are diſlodged and evacuated.

§ 1074. The probability of this notion will be more evident, if we conſider, that part of the *perſpirable matter* is diſcharged from the nervous *tubuli*; and that thoſe *perſpirable* particles (or excrementitious parts of the nervous fluid) may have different *figurations*, and ſome of them may be *acrid*, or ſharp-pointed; and, conſequently, may occaſion pain, if (by any incidental cauſe) they happen to be accumulated at the extremities of the feeling nerves.

§ 1075. I may add, that if the production, nutrition, and growth of the hair are derived from the nerves, it will prove that various ſorts of particles may be ſecreted by the brain, and propelled into the nervous *tubuli*, and excreted from them in the hair; and this alſo may be concluded from the different kind of hair.

§ 1076. It deſerves inquiry, whether ſome of the PAINS, we call *nervous*, are not produced in this manner.

§ 1077. *Pain* produced by pulling off a hair is excited in this manner, viz. by occaſioning a violent *preſſure* on the extremity of the nerve; for the hair (being connected with parts of the *cutis* and *epidermis)* when it is with force pulled, contracts thoſe parts, wherewith it was connected, over the extremities of the nerves, and occaſions a violent compreſſion of it, and pain in conſequence thereof.

§ 1078. I may obſerve further, that as (it is certain) very *acrid* and pungent particles do exiſt in the blood of ſome bodies, and as there are endings of nerves in the coats of the ſanguine arteries, ſo it is reaſonable to think that the ſharp points of ſuch particles may ſtrike ſometimes againſt the ſides of thoſe arteries, pierce through the covering membrane, and prick the extremities of ſome nerves, and excite pain in a manner ſimilar to what happens on touching a nerve with the point of a lancet or needle.

§ 1079. And probably ſome *ſhifting* or *moving pains* may ariſe from this cauſe; as ſuch particles in the courſe of their circulation may happen to ſtrike againſt the ſide of the arteries, ſometimes in one, ſometimes in another part of the body.

§ 1080. I hope it appears from what has been ſaid, that the proximate cauſes of pain are either,

I. Too great a *preſſure* againſt the extremities of ſome *feeling* nerves; or,

II. The *immediate contact* of *acrid*, ſharp-pointed, or other hard particles, with the extremities of ſome *feeling* nerves.

§ 1081. Since therefore theſe cauſes are the only cauſes productive of pain *hitherto diſcovered*, we have reaſon to conclude, when a perſon complains of pain, that there is either, 1. A too great preſſure againſt the extremities of the nerves affected, produced either, 1. By an obſtruction and diſtention of the ſanguine arteries in the part which is the ſeat of the pain, occaſioned by *viſcid* humours in the blood, or particles *too bulky* for an eaſy circulation; or, 2. By ſome *conſtriction* of the ſanguine veſſels; or, 3. By ſome *adjacent tumour*; or, 4. By *elaſtic* air ſubſiſting in too great a quantity in the part affected.

§ 1082. Or elſe, II. We muſt conclude, that the pain was produced by ſome *acrid* particles excreted from the blood, accumulated and adhering to the extremities of the nerves under their covering membrane in the part pained.

§ 1083. We muſt endeavour to find out the *cauſe* which produced the pain: we preſently know the CONSTITUTION of every patient, whether it is *temperate*, *ſanguine*, or *lymphatic*; and can ſoon inform ourſelves as to moſt perſons (by proper examination) whether the force of the action of the heart be *too great* or *too little*; and whether there is a dry or a moiſt *intemperies* of the ſolids; whether the nerves are ſtrong, or weak; whether there is an *acrimony* in the animal fluids; and whether the blood is *viſcid*, or not; and by the help of this knowledge, and the conſideration of all concomitant ſymptoms, we may pretty well find out the cauſes of thoſe pains which afflict our patient.

§ 1084. And may thence deduce the *curative indications*, and the proper remedies for his recovery.

§ 1085. As I have mentioned two ſorts of cauſes productive of PAINS, and ſeveral particulars comprehended in them, ſo I may obſerve, that thoſe cauſes may act *ſingly*, or in *combination*; and that in ſome patients various ſorts of pain may ſubſiſt at the ſame time; or their pains may be produced by complex cauſes.

§ 1086. We ſhould, in every patient, conſider whether his pains are produced by one cauſe acting ſingly, or by more; becauſe pains reſulting from *complex* cauſes require different methods for the cure of them, &c.

§ 1087. I have obſerved that ELASTIC AIR is often the cauſe of painful *preſſures* againſt the extremities of the nerves affected.

§ 1088. And as it may remove ſome difficulties, and promote a clearer apprehenſion of the manner whereby ſome ſorts of pain are produced, I ſhall endeavour to ſhew how *elaſtic* AIR may be *tranſmitted* from one part of the body to another; which I ſhall do in the following obſervations, viz.

§ 1089. 1 Obſ. That *elaſtic air* may be tranſmitted from the blood in the *meſenteric* arteries through the *lymphatic* veſſels and miliary glands into the cavities of the ſtomach and bowels.

§ 1090. The truth of this propoſition will appear, if we conſider, that as there are great quantities of *air* in *ſolid* ſubſtances, whoſe parts are very compact, and their *interſtitia* exceeding ſmall, as in *marble*, *alabaſter*, &c. which *air*, however,

ever, is eaſily ſeparable from them by proper *diſſolvents* (as I have found by EXPERIMENTS), ſo it appears reaſonable to think, that in *fluid* ſubſtances, where the *interſtitia* are larger, there may be greater quantities of *air*; and conſequently, that in the *blood* and *lymph*, and in every humour ſecreted from the blood, there is *elaſtic air*.

§ 1091. And we may well imagine, that AS the humours ſecreted into the *ſtomach* and bowels may ſometimes abound more with *air*, or be more *flatulent* than at other times, so in the cavity of theſe *viſcera* (where there is more ſpace and leſs compreſſion than in the minute tubes from which they come) the particles of *air* may more eaſily expand themſelves, or exert their natural *elaſticity*.

§ 1092. Beſides, the ſecreted *digeſtive* humours emptied into the *ſtomach* may ſometimes derive from the blood ſuch *qualities*, that in ſome ſorts of ALIMENT they may produce a FERMENTATION, or *generate* much *air*; like *baum*, or *yeaſt*, which though it cannot put water into a ferment, yet will produce a great fermentation when mixed with *wort* of *malt*, *moloſſes*, &c.

§ 1093. The truth of my obſervation will, I think, be yet more evident from ſome of the experiments made by Dr. HALES. He ſays, "Though air, when blown in at the *aorta*, will "not thence enter the cavity of the guts (that is "*per ſe*) yet it will paſs thither, when it lays in "a latent ſtate in the *interſtices* of a liquor: for "having cut aſunder in two places a dog's gut, "at the diſtance of two feet length, I waſhed "that piece of gut clean, by paſſing of warm "water through it, then tying up each end of it "*new*, *frothy ſmall-beer*, which was *blood-warm*, "flowed from a perpendicular height of four and "a half feet through the deſcending *aorta*, and "thence, after ſome time, in *conſiderable quantities*

" into the *ſtomach* and *guts*. When I warmed " this again over the fire, freſh froth aroſe on the " top of it: an argument that the flatulent *air* " generated in the *ſtomach* and *bowels*, may not " ariſe wholly from *flatulent* food, but that it may " in part alſo ariſe from too flatulently diſpoſed " ſecretions, that are made into the *ſtomach* and " guts from the glands of thoſe *viſcera*." (Vid. Dr. Hales's *Hæmaſtatics*, p. 140, 141.)

§ 1094. Such experiments prove that *air*, in the *interſtices* of a fluid, may be *tranſmitted* from the ſanguine arteries, and through the minute *lymphatic* veſſels into the cavity of the *ſtomach* and bowels; which evinces the truth of my firſt obſervation (§ 1088.) which may well be the foundation of another, viz.

§ 1095. Obſ. 2. That *air* may paſs into the *blood* with the chyle through the lacteal veſſels; for theſe veſſels are larger than many of thoſe ſecreting *tubuli*, which tranſmit humours from the blood in the *meſenteric* arteries into the cavity of the *ſtomach* and *bowels:* I may add, that we have reaſon to think there is more air in the *interſtices* of the contents of the *ſtomach*, and in the *interſtices* of the *chyle*, than in any fluid contained in the human body.

§ 1096. Obſ. 3. That therefore a too *flatulent* chyle may occaſion a too flatulent blood; or too much *air* to be in the blood.

§ 1097. And we may reaſonably apprehend, that *too much* air in the blood may be one cauſe of that ſort of *rheumatic pains* which return or increaſe in perſons upon their becoming warm in bed: the *heat* rarifying the *air* in ſuch blood, may occaſion the particles of it to expand themſelves, and to make painful preſſures againſt the extremities of the nerves in the coats of thoſe capillary ſanguine arteries, where the pains are felt.

§ 1098. And it deſerves notice, that theſe pains ſeldom happen but in bodies where the blood is *poor* and *watery*, and the coheſion of its parts weak.

§ 1099. I may add, that it appears alſo very probable that the *moving pains*, which ſome perſons feel one minute in this part of the body, and in a few minutes after in another that is diſtant, may be occaſioned by *air* in the blood, carried thither in the *interſtices* of a flatulent chyle.

§ 1100. Obſ. 4. That by the mixture of different liquid ſubſtances air is ſometimes *generated* and ſometimes *abſorbed*.

§ 1101. I would explain theſe terms, and therefore obſerve, that *air*, ſaid to be generated, was pre-exiſtent in the ſubſtances mixed together; and that this GENERATION of *air* is only a diſuniting the particles of it from that ſubſtance in which they before chiefly exiſted, by the action of the other ſubſtance; and upon which diſunion thoſe particles of air exert their *elaſticity*; which indeed was always in them, but reſtrained by their coheſion with the parts of the ſubſtance to which they adhered.

§ 1102. And by *abſorbing air*, I underſtand nothing elſe than its particles being ſo attracted by, and ſo cloſely uniting with, the parts of ſome other ſubſtance, as not to be capable of exerting any elaſticity.

§ 1103. However, it is certain, that *as*, by the mixture of ſome ſubſtances, quantities of air may be brought into a ſtate of *activity*, ſo by the mixture of other ſubſtances, quantities of *elaſtic* AIR may be reduced into an *inactive ſtate*.

§ 1104. Thus it is in all ſubſtances which attract, and imbibe, and retain particles of *air* in their *interſtitia*.

§ 1105. Loaf ſugar is an inſtance of this ſort.

§ 1106. I may add, when liquor (which has been made very hot by the action of fire, and thereby freed from many particles of air that were in the interſtices of it) grows cold, it imbibes or abſorbs into its *interſtices* as much air as had been expelled by the action of fire.

§ 1107. And thus *water*, eſpecially if mixed with a little *brandy* (which checks the fermentation of liquors, and ſtops the generation of air in them) be drank as hot as a perſon can eaſily bear it, as that heat abates when received into the ſtomach, it will abſorb air, and afford often great relief againſt flatulent pains in the ſtomach.

§ 1108. And here I would obſerve, that in all *flatulent* diſtempers thoſe things which will *abſorb* air, or bring the particles of it from their *elaſtic* into a fixed *inactive* ſtate, are very proper remedies.

§ 1109. I have, in the courſe of my practice, obſerved, that liquors made hot over the fire, and drank as hot as the patient could eaſily drink them without ſupping and blowing, have afforded a *ſenſible relief*, which, when taken cold, availed very little.

§ 1110. And therefore for perſons under *flatulent* ſymptoms, eſpecially of the ſtomach and bowels, both in *acute* and *chronical* DISEASES, I have ordered, with manifeſt advantage, their *juleps* and other liquid medicines to be firſt made very warm, and then taken: or, if I preſcribed ſolid medicines, I directed the doſes to be waſhed down with ſome diluting liquor made warm.

§ 1111. Whether the particles of the medicines thus managed do more powerfully attract and *abſorb* the particles of the *elaſtic* air or not, yet the benefit of the method, however produced, may well be a motive to the uſe of it with any patients troubled with flatulencies, or flatulent pains.

§ 1112. I have ſhewed how pains may be produced by *acrid* particles, brought to an immediate contact with the extremities of the nerves affected.

§ 1113. And it is proper to conſider the different kinds of *acrid* particles which may be productive of pain.

§ 1114. I may mention two general ſorts, viz. 1. Thoſe which are of an *alcaline* nature, and 2. Thoſe of an *acid* quality.

§ 1115. 1. Thoſe *acrid particles* which are of an *alcaline* nature. Here I ſhall lay down a propoſition which well deſerves notice, on the account of its truth, and the many important *rules* of conduct deducible from it, viz.

§ 1116. Prop. That all the *acrid particles*, ſecreted or excreted from the blood, in any part of the body, are of an *alcaline* quality.

§ 1117. I mean, by the term *alcaline*, that quality in any matter which is the occaſion of fermentation, when mixed with liquid ſubſtances of an *acid* nature.

§ 1118. There may be as many different ſorts of *alcaline* particles as there are of *acid*, both of the *vegetable* and *chymical* kinds. And there may be particles of *ſalt* in the *fluids* and ſolids of human bodies, which are of a *neutral* nature; that is, properly ſpeaking, neither *alcaline* nor *acid*.

§ 1119. Such *neutral* ſalts (for aught I know) may be mixed with theſe *alcaline* ſalts, that enter the compoſition of the *calculi* in the kidneys and bladders of men, and alſo with the *alcaline* ſalts extracted by *chymical analyſis* from the blood, and from the ſolid parts of human bodies: and if there are ſuch, then thoſe animal ſalts are compounds of different kinds of ſalts.

§ 1120. But then the *queſtion* is, whether the predominant quality of thoſe *compounds* be of an *alcaline* nature or no.

§ 1121. That they are of an *alcaline* nature will appear, if we conſider a few things, viz.

1. That *no acid* particles have ever been found exiſtent in the blood, or have ever been ſeparated from it by any chymical proceſs whatever; and conſequently, that no *acid* particles ever exiſt in the blood. And if this be fact we may juſtly infer, that the acrid particles ſecreted or excreted from the blood are not of an *acid* nature.

§ 1122. 2. That the *acrid* particles extracted from the blood by chymical *analyſis* have been found to be of an *alcaline* nature. The *ſaline* or acrid particles, which with particles of air make up almoſt the whole ſubſtance of the human *calculus*, have been proved by experiments to be *alcaline:* and the *gouty* humours excreted to the joints have been proved to have the ſame quality.

§ 1123. And this appears from the experiments of Signior *Micheli Pinelli*. He ſays, "I have "found by chymical proceſſes, that the ſolid "ſubſtances of human bones, and the *circum-* "*ambient* parts, is compoſed of *phlegm*, *oil*, an "*alcaline*, *volatile ſalt*, and a little *earth*."

§ 1124. There is a question which deſerves a little notice, viz. How it comes to paſs, ſince much of our aliment abounds with *acid* or *aceſcent* particles, and go into the ſtomach with the *ingeſta*, and are mixed with the *chyle*, that they do not with the chyle paſs into the blood?

§ 1125. I anſwer in the *affirmative*, that they certainly do paſs into the blood, *but not* till they have loſt their figure and properties as *acids*.

§ 1127.

§ 1126. We know that by mixing a ſufficient quantity of the *ſalt of wormwood*, or of the *ſalt of tartar*, with the *juice* of *lemons*, the texture or figuration of the *acid* particles of that *juice* will be altered: they will be deprived of their ſenſible, eſſential properties.

§ 1127. And I think it may be affirmed, that the far greateſt part of our FOOD is either *alcaline* or *alcaleſcent:* ſuch is all our animal food, and a great part of our vegetables, which may contribute much to alter the quality of the *acid* and *aceſcent* aliments, which are commonly uſed, but in much leſs quantity in our diet.

§ 1128. And we ſhould conſider that all the humours ſecreted from the blood, and chymically analyſed, have by experiments been found to contain *alcaline ſalts*. Theſe exiſt in all parts of the body, in the fluids as well as in the ſolids; and conſequently in the *digeſtive* or *diſſolvent* humours ſecreted by the ſalival glands, and by the glands which empty their fluid directly into the ſtomach; and likewiſe both in the *hepatic* and *pancreatic* ſecretions, more eſpecially in the former.

§ 1129. Now if we conſider theſe things, and that all the *ſalts* and ſpirits extracted from the blood *chymically*, have been *always* found to poſſeſs the known properties of *ſalts*, and *ſpirits* acknowledged to be of an *alcaline* nature; it may convince us, that the *acid* aliments received into the ſtomach, loſe their properties as *acid* before they get into the blood.

§ 1130. The *alcaline* aliments and *digeſtive* fluids, upon mixing with them, alter and deſtroy their acid quality.

§ 1131. It may be, ſome will put this queſtion, viz. If *no acids* enter into the blood, how is it that they are ſo uſeful in curing many fevers and other diſeaſes, *chronical* as well as *acute?*

§ 1132. It may be replied, that although we ſhould not be able to give a clear account of the *modus* of their operation, yet it is obvious from their effects, that the *acid* particles received into the ſtomach (though they loſe their figure and properties, yet) produce *that* QUALITY in the *chyle*, which, on its mixture with the blood, abates the *alcaline acrimony* of it, renders it thinner, and the circulation of it more free and eaſy: and in this manner may be produced thoſe good effects which have been obſerved to follow a diſcreet uſe of *acids*.

§ 1133. 2. The other general kind of *acrid* particles productive of pains, are of an *acid* nature. And here I would obſerve, that pains produced by *acrid* particles of an *acid* quality, only happen in the *mouth*, *oeſophagus*, *ſtomach*, and *inteſtines*, i. e. in the *primæ viæ*.

§ 1134. And the reaſon hereof is obvious, viz. becauſe they loſe their *acid* properties before they paſs into the blood, &c.

§ 1135. Thus I have conſidered the SYMPTOMS of PAIN in general: it appears, 1. That every pain is produced by the *action* or impreſſion of ſome object againſt the extremities of thoſe *feeling* nerves that are affected with it. 2. That wherever there is pain, there is alſo ſome *obſtruction*, either by preſſure, or by *immediate contact*, of ſome *acrid* particles of one kind or other, with the extremities of the nerves affected: and the reaſons of my opinion I have, in as clear a manner as I could, propoſed for your conſideration.

§ 1136. And according to my theory (which is no *hypotheſis*, but grounded upon facts, on the real ſtate of things in the human body, when afflicted with pains) I muſt obſerve that the *curative* indications in general are theſe, viz. 1. To remove the preſſure from the nerves affected, when too great a preſſure againſt them is the cauſe of the ſymptom. 2. To alter the *quality* of the *acrid* particles, and remove them from their contact with the extremities of the nerves, when the pains are the effects of ſuch immediate contact. And in every caſe there muſt be a careful examination of the patient, for diſcovering the *morbid quality* or qualities ſubſiſting in the blood; becauſe the knowledge of them is neceſſary to direct us in the choice of proper *alteratives* for removing the ſymptom.

§ 1137. I may add, that when *acrid* humours of any ſort produced the pains, *oleagenous* and *mucilaginous* medicines, that may ſerve as it were to *ſheathe* the *acrimonious* particles, often afford a ſpeedy, palliative relief to the ſick, till *alterative* remedies accompliſh their end, of freeing the animal fluids from their morbid quality.

§ 1138. I ſhall now make ſome brief remarks on the *ſymptoms* of PAIN, as to their QUALITIES, and as to the PARTS affected with them.

§ 1139. I. As to their ſeveral *qualities*. Different pains are attended with different ſenſations, and accordingly have different denominations; particularly the following, viz.

§ 1140. 1. PAINS *acute*, *lancing*, *cutting*, and *grinding*: that is, pains like thoſe we ſhould feel, if any part was cut with a lancet, or knife, or ground with any hard thing.

§ 1141. Theſe pains commonly happen in the membrane called the *perióſteum*, which cloſely adheres to and is the immediate covering of the bones.

§ 1142. If theſe pains are extreme, and frequently return with but ſhort intervals, as it is ſometimes the caſe in the *febrile* ſtate of the *ſmall-pox*, they ſignify that the minute, capillary veſſels of the *perioſteum* are exceedingly diſtended, and their adjacent nerves violently compreſſed; and ſhew that there is both a *viſcidity* and a great *acrimony* in the animal fluids, &c. an *acrimony* of a very *diſſolvent* nature.

§ 1143. This ſymptom in the *variolous* fever has often been followed with ſome *hæmorrhage:* and when we meet with it, we may fear ſome evacuation of blood will enſue. I have found it ſo.

§ 1144. The conſideration of theſe things will lead us to order, for a patient under this ſymptom, ſuch medicines as may remove the morbid qualities, and preſerve the natural conſiſtence of the blood; and maintain the proper tenſeneſs of the veſſels, &c.

§ 1145. 2. PAINS *heavy*; that is, ſuch as are not ſharp, but moderate, and attended with a ſenſe of *weight* or heavineſs in the part affected. Theſe ſeem to ariſe either, 1. From the preſſure of ſome adjacent tumour; and then the cure depends on removing that tumour; or, 2. They are produced by an obſtructed circulation and diſtention of the capillary *ſanguine* or *lymphatic* arteries in the parts where they happen, though not to that degree, which brings on *acute pains.* When the *heavy* pains are thus occaſioned, they diſcover a *viſcid* quality in the blood, and that thoſe medicines which may remove it are the proper remedies.

§ 1146. 3. PAINS *biting* and *gnawing*; that is, pains which produce ſuch uneaſy ſenſations, as the patient apprehends he ſhould have if the part affected was *bit* or gnawed by the teeth of any animal.

§ 1147. Theſe ſeem to be produced by *pungent, corroding* particles mixed with a *viſcid* blood, which in their *ſlow paſſage* through obſtructed veſſels come to an immediate contact with the nerves affected: for if there were no *acrid*, corroding particles in the blood to be brought to contact with the nerves, there could be no ſenſations fit to be deſcribed by the words *biting* or *gnawing*; and if there was no *viſcidity* in the blood to occaſion an obſtructed and ſlow circulation, the pains would be exceeding tranſient.

§ 1148. This ſymptom, therefore, ſhews that there is both a *viſcid* and an *acrimonious* quality; and therefore that the curative indications lead us to preſcribe ſuch *alterative* medicines as may effectually remove both theſe morbid qualities.

§ 1149. 4 Pains *ſtitching*; that is, pains producing a ſenſation as if the parts affected were drawn violently together with a thread. This ſymptom is moſt frequent in *chronical* caſes.

§ 1150. Theſe pains ſeem to be occaſioned by an extraordinary influx of fluids into the part affected, violently contracting it, and making a violent preſſure againſt the nerves ſeated in it; and are a ſort of *ſpaſmodic* pains.

§ 1151. The indication of cure is to promote the circulation of the fluids onwards through the part affected; for which purpoſe ſome drops of the *ſp. c. c. per ſe*, *ſp. ſal. volat. oleoſ. ſp. lavendul.* diluted with water, &c. are proper remedies.

§ 1152. And if this ſymptom happens in any external part, the rubbing it *cum ſp. vini rect. vel ol. ſuccini* may be very ſerviceable.

§ 1153. 5. Pains *pricking*; that is, pains which produce ſenſations, like thoſe we ſhould have, if pricked with pins or needles. Theſe ſeem to be the effects of *ſaline* or other *acrid* and pungent particles ſtriking againſt the extremities of the nerves in the *cutis*, as they are preſſing through the perſpiratory and other ſubcutaneous ducts for excretion.

§ 1154. This ſymptom diſcovers that the blood abounds with *ſaline* or other acrid particles; and the curative indication obliges us to preſcribe ſuch *alterative* medicines as may change the figure of the morbid particles, and promote their paſſing out of the body through the natural ways of evacuation.

§ 1155. 6. PAINS *ſtinging*; that is, pains like thoſe we feel when ſtung with nettles.

Theſe ſeem to reſult from the ſame cauſe which produced the laſt mentioned ſymptom, when it exiſts in a ſomewhat lower degree; and has proportionally the ſame ſignification, and curative indication.

§ 1156. 7. ITCHINGS; (being uneaſy ſenſations ariſing from the ſame cauſes which produced the two laſt mentioned ſymptoms, though in this caſe they are in a lower degree) I reckon in the claſs of pains; and muſt obſerve that their ſignification and curative indication appears from what has been ſaid under thoſe particulars.

§ 1157. 8. PAINS *moving*; that is, thoſe which ſhift from one place to another; being ſometimes in the arms, at other times in the back or legs, &c.

§ 1158. Theſe ſeem to be produced either, 1. By too much *air* ſubſiſting in the blood; or, 2. By an unequal *viſcidity* in it; or, 3. By ſome particles much *too bulky* for an eaſy circulation; and which, when they or the *viſcid* humours happen (in the courſe of their circulation) to be thruſt into ſome capillary veſſels, do diſtend the ſides of them ſo as to make painful preſſures againſt the extremities of the adjacent nerves.

§ 1159. And as we cannot always certainly know which of the cauſes mentioned was the productive cauſe of the ſymptom, or whether they did not conjunctly act, there is reaſon (for the relief of a patient under it) to preſcribe thoſe remedies which may reduce the *elaſtic* air in ſome meaſure to a ſtate of inactivity, and thoſe which may remove the *viſcid* quality of the blood.

§ 1160. 9. PAINS *fixed*; which are ſuch as remain many hours or days in the ſame parts of the body.

§ 1161. Theſe proceed from a *continued* obſtruction of the veſſels in the part affected; by means of which they remain diſtended, and the painful preſſure againſt the extremities of the adjacent nerves is continued.

§ 1162. And as the obſtruction and diſtention of the veſſels in the part affected were occaſioned by *viſcid* humours, or particles *too bulky* for an eaſy circulation, we may infer that the curative indication obliges us to preſcribe thoſe *alterative* medicines which may remove the morbid quality of the blood, and render the circulation of the animal fluids eaſy through the minuteſt veſſels.

§ 1163. 10. PAINS *pulſative* or *throbbing*, ariſing partly from a greater obſtruction in the capillary, *ſanguine*, and *lymphatic* arteries, than was in the laſt mentioned ſymptom; and partly from every appulſe of blood to thoſe parts of the veſſels which are obſtructed; and partly from a *putrefactive* motion in the ſtagnant humours.

§ 1164. For theſe pains ſeldom happen but when there is ſome inflammatory tumour, as a *phlegmon*, *bubo*, &c. and then it is a ſymptom diſcovering that the tumour is ſuppurating; and that ſuch *alterative* medicines ſhould be adviſed as may remove thoſe morbid qualities from the blood, which occaſioned the obſtructions in the veſſels affected.

§ 1165. 11. PAINS *periodical*; that is, pains which ceaſe, and return again at a certain period of time, as every morning or every afternoon, or every other day, &c.

§ 1166. Theſe I eſteem a ſymptom of an *intermitting fever*, even though it ſhould not be attended with the ſenſible febrile ſymptoms of a *quick* pulſe, heat, thirſt, &c.

§ 1167. This ſymptom has happened to ſome patients under my care, who had no other ſign of a fever. I preſcribed for them ſuch medicines as take off intermitting fevers, and thereby they became free from their pains.

§ 1168. This ſymptom does not attend all *intermittents*, but only thoſe where the blood has ſuch a *viſcidity*, as renders the circulation of it difficult to a certain degree in one or other part of the body; and there diſtending the capillary, ſanguine, or lymphatic arteries, ſo as to occaſion painful *preſſures* againſt the nerves affected.

§ 1169. This ſymptom is to be cured by thoſe *alterative* medicines which cure intermitting fevers.

§ 1170. It muſt be obſerved, that the ſeveral ſorts of pain animadverted on, may admit of a great variety of different *degrees*; and are more or leſs, as the cauſes productive of them are ſtronger or weaker.

§ 1171. II. I may now make ſome remarks concerning pains, as to the parts affected with them; and in general obſerve, that they may be produced *in* all parts of the body where the *feeling* NERVES terminate.

§ 1172. They may be produced, 1. In any part of the *external ſuperficies* of the body, and likewiſe in any part of the *internal ſuperficies* from the *mouth*, through the *oeſophagus*, *ſtomach*, and *inteſtines*.

§ 1173. 2. Pains may be produced on the ſuperficies of any of the *viſcera*, e. g. the *liver*, *ſpleen*, *pancreas*, *kidneys*, &c.

§ 1174.

§ 1174. 3. Pains may be produced in the *perioſteum* of the bones, between their two ends, &c. theſe generally are very acute, and ſometimes occur in the beginning of the ſmall-pox, if of the confluent kind, or higher degree of the diſtinct.

§ 1175. 4. Pains may be produced at the extremities of the bones; that is, in the joints. Such are *gouty* pains, &c.

§ 1176. 5. Pains may be produced in the tendinous parts of the muſcles near the joints. Such are *rheumatic* pains, &c.

END of LECTURE IX.

LECTURE X.

On the various kinds of eruptions on the external ſuperficies of the body in acute diſeaſes.

§ 1177. X. THE next claſs of *ſymptoms* comprehends thoſe which appear on the external *ſuperficies* of the body: and theſe I ſhall divide into two claſſes, viz.

1. Thoſe which happen in *acute* diſeaſes; and
2. Thoſe which occur in *chronical* diſtempers.

§ 1178. But for the better underſtanding cutaneous diſtempers, I may obſerve, that every ERUPTION, flat or riſing, conſiſts of matter excreted mediately or immediately from the blood; and that every tumour, not only in its riſe, but alſo in its increaſe (let its bulk grow to whatever magnitude) derives every particle of which it conſiſts from the blood, &c.

§ 1179. The following particulars deſerve notice, viz.

1. That all excretions, or humours excreted to the ſuperficies of the body, conſiſt of the *ſanguine*, or of the *lymphatic*, or of the *nervous* fluid: that is, of one or other of theſe ſingly; or of ſome two of them; or of all three of them jointly: and of theſe in ſome proportion of one to the other: and there may be a vaſt variety of differences in the degrees of ſuch proportions.

§ 1180. 2. That neither the excretion of meer *lymph*, nor of meer *nervous* fluid, ſingly or jointly, can produce a red colour in any part of the ſkin.

§ 1181. 3. That, therefore, if any cutaneous *eruption* appears *red* in any degree, it muſt have derived from the blood ſome *red* particles to be the foundation of that appearance.

§ 1182.

§ 1182. 4. That the matter which makes or conſtitutes any *eruption*, whether it be a general *colour*, *ſpot*, *puſtule*, or *tumour* of any ſize on the external ſuperficies of the body (beyond all doubt) did immediately pre-exiſt in one or other of the three fluids mentioned (§ 1179.); ſingly or partly in ſome two of them, or partly in all three of them.

§ 1183. I propoſe diſtinctly to conſider the principal particulars contained in each claſs; and

§ 1184. I. Thoſe ſymptoms which, in *acute* diſeaſes, appear on the external *ſuperficies* of the body. And theſe may be ſubdivided into thoſe which are *flat*, and thoſe which are *riſing*.

§ 1185. 1. Of the *flat* eruptions. I call thoſe *flat* eruptions, by which no part of the EPIDERMIS is *ſenſibly* elevated: and the principal of this ſort are the following, viz.

§ 1186. 1. The *red colour* of the ſkin, which ſometimes appears in the beginning of a *variolous* fever. This is a dreadful ſymptom, which ſometimes happens to perſons taken ill of the *ſmall-pox*, often on the ſecond day of their ſickneſs, but ſometimes before the firſt is ended.

§ 1187. The face and hands, at the firſt coming on of this ſymptom, appear very *red*, and, when preſſed with one's finger, the part preſſed will look *white*, but immediately the *redneſs* returns: the next day the redneſs is found diffuſed all over the ſurface of the body, and the colour much deeper; and then no *whiteneſs* appears upon preſſing the fleſh with one's finger. Thus I have found this ſymptom, when I have met with it.

§ 1188. And ſome *hæmorrhage* or other, commonly, ſoon follows this ſymptom.

§ 1189. This REDNESS of the ſkin ariſes from particles of *red* blood propelled from the capillary, ſubcutaneous, ſanguine arteries, into the ſubcutaneous, lymphatic arteries lying under the *epidermis*.

§ 1190. The reaſon why the parts preſſed with the finger turn to look *white* at the firſt appearance of this colour, is becauſe the *blood* extravaſated into the *lymphatic* arteries remains fluid, and has that tenuity as to recede upon the preſſure of the finger, and as to return on the ceaſing of that preſſure: and the reaſon why no *whiteneſs* appears the day following, is becauſe the blood extravaſated into the lymphatic arteries, is then become *ſtagnant:* becauſe, there having been a continual propulſion of red particles into thoſe lymphatic arteries, the obſtruction of them has increaſed ſo much, that their contained fluid cannot paſs out of them.

§ 1191. The productive cauſe of this ſymptom is a very *diſſolvent* quality in the blood, or *diſſolvent* particles diffuſed in it, which break and divide the red globules into parts minute enough to paſs into the lymphatic veſſels, made *lax* by the ſame diſſolvent cauſes.

§ 1192. This ſymptom diſcovers to us, that there is ſuch a diſſolution of the conſiſtence and texture of the blood, as is not like to be cured by any medicines, and therefore foreſhews the death of the patient.

§ 1193. The indications, and method of cure, are the ſame as in the caſe of *variolous hæmorrhages*, whether with the urine or ſtools, which ſymptoms proceed from the ſame cauſe.

§ 1194. 2. The SCARLET colour of the ſkin, in acute diſeaſes, as in the ſcarlet fever, is another ſymptom to be conſidered.

§ 1195. If we are called to a patient, and find he has been ill of a fever a day or two, and obſerve in his ſkin *red ſpots*, verging to the ſcarlet colour, the ſkin between them appearing as in health; and in after-viſits find theſe ſpots broader and more numerous, and redder than the eruption in the *meaſles*, we know hereby that the diſeaſe is that commonly called the *ſcarlet fever*.

§ 1196. And we are confirmed in this opinion by obſerving, that in two or three days the *epidermis* grows rough, and then gradually falls off in ſcales.

§ 1197. This ſymptom (§ 1194.) may be diſtinguiſhed from the *red colour* in a variolous patient; becauſe that red colour was preceded by pains in the *head* and *back*, and other *variolous* ſymptoms, from which the perſon under a *ſcarlet* fever has been free, &c.

§ 1198. The cauſe of this ſymptom (§ 1194.) ſeems to be a violent *attrition* of the *red* globules: ſome parts of which have been broken off, and propelled from the ſanguine, ſubcutaneous arteries through the lymphatic arteries lying under the *epidermis*; and there being extravaſated by degrees ſeparate the *epidermis* from the *cutis*.

§ 1199. I mention a violent *attrition* of the *red* globules as the productive cauſe of this ſymptom; becauſe extreme *heat*, and a very quick and ſtrong pulſe commonly precedes it.

§ 1200. And this being the real ſtate of the caſe, may help us to underſtand the reaſon why no more red particles are excreted from the blood to the *epidermis*, and why no *hæmorrhage* follows the *red colouring* in a ſcarlet fever, as it often does in a variolous fever, viz. that the extreme heat, in the *ſcarlet* fever, *inſpiſſates* the blood; and ſoon ſtops the excretion of *red* particles, and prevents hæmorrhages.

§ 1201. The curative indication is to preſcribe thoſe *alterative* medicines which may remove the morbid quality of the blood, and reduce it to its healthy conſiſtence; i. e. medicines which may abate the febrile heat, the force of the action of the heart, and the celerity of the pulſe, and attenuate the animal fluids.

§ 1202. 3. The *reddiſh*, *ſuperficial* PETECHIÆ, that is, *ſmall*, *round*, *diſtinct*, *red*, and *flat* ſpots, in appearance ſomewhat like thoſe made by the bitings of fleas.

§ 1203. If we examine theſe by puncture with a needle, and pain is excited by the puncture, they are the ſymptom now under our conſideration, otherwiſe they are not.

§ 1204. There may be differences as to the degree of colour in different bodies: in ſome it may be brighter, and in others deeper.

§ 1205. This ſymptom (§ 1202.) is produced by globules of blood broken, and propelled from the ſubcutaneous ſanguine arteries through lymphatic veſſels to their endings, where they appear through the *epidermis*.

§ 1206. And that they produce no pain, though brought to immediate contact with the extremities of the nerves, is becauſe of their *ſoftneſs* and *ſmoothneſs*: or becauſe they are *not extravaſated* from the *lymphatic* arteries, but ſtop at the extremities, and thence appear through the *epidermis*, and do not come to a contact with, or to preſs againſt, the extremities of any of the nerves.

§ 1207. If the pulſe of the patient be *quick* and *weak*, and the heat of his fleſh moderate, we may conclude that this ſymptom reſults from *diſſolvent* cauſes.

§ 1208. The curative indications and the proper remedies are the ſame as in the caſe of putrid fevers, attended with a bloody urine.

§ 1209. Theſe *petechiæ* are only ſuperficial, and though a threatening ſymptom, yet not a certain ſign of death. I have had patients recover who have had them.

§ 1210. 4. In acute diſeaſes the *purple*, *livid*, or *black* PETECHIÆ is a dreadful ſymptom: they are *flat*, *diſtinct*, *round* SPOTS of ſuch colours; and are ſo many MORTIFICATIONS, and to be diſtinguiſhed from the former ſort by the patient's not being ſenſible of pain in thoſe parts, though a ſharp needle or lancet be thruſt into them. Theſe ſometimes happen in the *ſmall-pox*, and in other fevers, *putrid* and *peſtilential*.

§ 1211. Theſe may be reckoned certain tokens of death approaching, as they ſhew that the lymphatic veſſels are exceedingly relaxed; and that the blood is in a great meaſure diſſolved, and putrified, and ſtagnant in thoſe parts where the ſpots appear.

§ 1212. The productive cauſes of this ſymptom are the ſame with thoſe that bring on a bloody urine, and the remedies are the ſame.

§ 1213. And though the caſe is moſt deplorable, yet the proper remedies ſhould be uſed while life remains; becauſe ſome perſons have recovered, when there has not been the leaſt probability of it.

§ 1214. 2. I ſhall conſider the *riſing* eruptions; that is, ſuch as elevate the *epidermis* more or leſs, &c. the principal of this ſort are the following, viz.

§ 1215. 1. RED SPOTS: theſe are of different figures and extent: formed of ſmall, red *puſtules*, not far diſtant one from another; and as to ſize, from the bigneſs of a ſmall pin's head to a great pin's head.

§ 1216. If a patient has been ill of a fever about four days, and the eruption now deſcribed appeared; and with a *cough*, and a *watery humour* running from his eyes and noſe, we may ſay he has the MEASLES, and that the eruption is of the *morbillous* kind.

§ 1217. The MEASLES is a diſtemper *ſui generis*, and thoſe particles of matter which produce it are ſpecifically different from thoſe which produce the *ſmall-pox*, *plague*, or any other ſort of ſickneſs, &c.

§ 1218. And *as* the variolous particles in producing the *ſmall-pox* aſſimilate parts of the blood into their own nature, *ſo* the morbillous particles operate in like manner.

§ 1219. And let me obſerve, that the minute puſtules in the meaſles conſiſt partly of *morbillous* particles, and partly of *red* particles (from the globules of the blood which give the red colouring to the puſtules), and partly of a *thinner* lymph than is excreted in the ſmall-pox.

§ 1220. And the reaſon why the morbillous puſtules do not ſuppurate like thoſe of the *ſmall-pox* I take to be this, viz. that there is leſs blood in theſe, and a much leſs quantity of humours excreted to the outward ſuperficies of the body, and that the *morbillous* and ſanguine particles are mixed with a *thinner* lymph; which tranſpiring through the pores of the *epidermis*, prevents a *ſuppuration*, and occaſions the morbillous puſtules to grow dry. The curative indications are to maintain the *vis vitæ*, to attenuate the animal fluids, and promote the excretion of the morbillous particles from the blood; and carefully to avoid every thing that may occaſion a *revulſion* from the external ſuperficies of the body *ad intra*; and likewiſe to avoid all external methods and applications which may repel any humours from the ſuperficies of the body inwards.

§ 1221. 2. PUSTULES that are *ſmall*, *clear*, *pellucid*, nearly of a pearl colour, and about the bigneſs of *millet* ſeeds, is another ſymptom to be conſidered.

§ 1222.

§ 1222. When we are called to a patient under this SYMPTOM, it will be proper to inquire, whether it was not preceded by an *oppreſſion* of the *thorax*, a *dejection* of his ſpirits, *ſighing*, and a *pain* in his head: we ſhould likewiſe obſerve, whether his pulſe be not quick, and weak, &c.

§ 1223. If we find that ſuch ſymptoms preceded, and that he had been ill about eleven days before the *eruption* appeared, we then know that his diſtemper is the *miliary fever*.

§ 1224. Theſe puſtules are formed of a very thin, aqueous humour, excreted either from the *nervous tubuli*, or from lymphatic arteries, or partly from both, &c.

§ 1225. It is my opinion, if the puſtules are clear, and without redneſs or colour, and if the humour excreted to them is very thin; I ſay it is my opinion, that the humour excreted to theſe puſtules is, chiefly at leaſt, from the nervous *tubuli*; becauſe the *lymphatic* arteries are larger, and a *watery* humour excreted from them in all probability would be more copious, and produce puſtules of a larger ſize; as in the *eryſipelas*, &c.

§ 1226. But the many nervous *ſymptoms* which precede, and attend this *eruption*, and accompany this ſort of diſeaſe to its period, puts the matter, in my judgment, out of all doubt, viz. that the *nervous tubuli* are that *ſeries* of veſſels, which is primarily and chiefly affected in this diſeaſe, as the heart and arteries are in *ardent* fevers: and that the *nervous* fluid is extraordinarily in a *morbid* ſtate, as the blood is in fevers of other denominations.

§ 1227. I apprehend that the *nervous* fluid in perſons under a *miliary* fever, has a much greater *tenuity*, and a certain *acrimony*; and is much more copious in quantity than in the time of health: and that theſe morbid effects in the nervous fluid reſult from the blood, when it is in an *acrimonious* and too watery a ſtate, and free from all viſcidity.

§ 1228. And I am confirmed in this opinion by conſidering the *weakneſs* and *quickneſs* of the pulſe which attend *miliary* fevers: for theſe ſymptoms plainly ſhew that there is neither too great a ſpiſſitude in the blood, nor any *viſcid* humours; nor particles too bulky to paſs through the minuteſt veſſels: and therefore, that the morbid *qualities* muſt be of a different nature from thoſe which produce other kinds of fevers.

§ 1229. Beſides, the ſtate of the vital, febrile heat (this being ſo very moderate where the eruption happens) and the languor of the ſpirits, ſhew that the fluid ſecreted by the brain is in a great meaſure deſtitute of thoſe ſubtle and active parts, which are neceſſary to the vigour of the vital functions and uſes of the body: I am now ſpeaking of a *ſimple miliary fever*, in which there are only minute, aqueous-like puſtules, &c.

§ 1230. We may infer, from what has been ſaid of the miliary *eruption*, and the fever of which it is a ſymptom, that two ſorts of remedies are needful, viz. 1. *alterative*, and 2. *reſtorative.*

§ 1231. 1. Alterative; that is, thoſe medicines which may remove the *acrimony* from the blood, and its too great *tenuity*.

§ 1232. For *as* the *nervous* fluid receives its proper conſtituent parts and healthful qualities from a *balſamic*, healthful blood, *ſo* it may receive improper component parts and morbid qualities from a blood that is in a *morbid* ſtate.

§ 1233. And therefore, to rectify a morbid ſtate of the matter ſecreted by the *brain*, we ſhould endeavour to rectify the ſtate of the blood, and remove the morbid qualities from it.

§ 1234. 2. Restorative remedies are requiſite: that is, ſuch medicines as may recover the blood to its natural healthy conſiſtence, ſupply what is wanting in it; and ſuch as may ſtrengthen all the animal veſſels, and reſtore the force of the action of the vital organs, &c.

§ 1235. I may add, that it is of great advantage to perſons under *miliary* fevers, if they are kept continually in bed, and a gentle *diaphoreſis* be continually maintained; becauſe this method may contribute much to leſſen the *too great* TENUITY of the blood, and of the *nervous* fluid; and conſequently very much promote their recovery.

§ 1236. Sometimes among the proper miliary puſtules will appear others that look RED; but theſe proceed from a different cauſe, and ſhew that the miliary fever is of a *complex* kind.

§ 1237. It is a complex caſe when *miliary* eruptions appear in the ſmall-pox. I had a remarkable inſtance of this in a *patient* in the ſummer 1747.

§ 1238. She was a young woman of about eighteen years of age, and under the confluent kind of the *ſmall-pox*, which came on with the uſual ſymptoms, and run through the uſual periods: but on her neck, breaſt, body, arms, &c. there were ten thouſands and thouſands of miliary puſtules, replete with a *pellucid*, *watery* humour: and though the variolous puſtules never ſuppurated kindly, yet they continued through the ſeveral ſtages.

§ 1239. I obſerved a very great weakneſs in her pulſe, frequent and great ſinkings of her ſpirits, that made her and thoſe about her apprehend ſhe would ſoon expire.

§ 1240. I found it neceſſary to preſcribe ſuch *alterative* and cordial medicines, as might at the ſame time correct the *acrimony* of the fluids, leſſen their tenuity, raiſe the pulſe and ſpirits, and promote a continual *diaphoreſis*; and I ordered a *cordial julep* to be always at hand, and that a doſe of it ſhould be given her whenever ſhe was ſick at ſtomach, or the ſinking of her ſpirits returned.

§ 1241. She always found a ſenſible relief from every doſe of her medicines, went ſafely through the diſtemper, and happily recovered.

§ 1242. Sometimes with the miliary eruption are intermixed many RED *puſtules*, commonly called a RASH; and when the fever is thus complicated, there are ſymptoms which diſcover that there has been ſome extraordinary ATTRITION of the blood: and in this ſort of *miliary* fever many of the minute PUSTULES ſuppurate, and often dry, and ſink, and diſappear without any maturation.

§ 1243. I have ſaid that in this *complex*, *miliary* fever there has been ſome extraordinary *attrition* of the blood; becauſe in this kind the PULSE is commonly ſtrong, as well as quick; the febrile heat intenſe; the tongue often dry; and the thirſt great: whereas it is otherwiſe in ſimple *miliary* fevers. But ſinkings of the ſpirits, oppreſſion about the breaſt, and involuntary ſighings are ſymptoms common both to the ſimple and complex *miliary* fever.

§ 1244. External cold muſt carefully be avoided in theſe diſtempers; and by ſuitable medicines a gentle *diaphoreſis* ſhould be promoted.

§ 1245. 3. PUSTULES *ſmall* and *ſuppurating*, as in the *ſmall-pox*, is another ſymptom deſerving our conſideration.

§ 1246. It is difficult, on the firſt and ſecond days of the eruption, to know the *variolous* puſtules *merely by their appearance* from other ſmall, red puſtules, e. g. ſuch as are called a raſh, &c.

§ 1247. But if we inquire about the antecedent ſymptoms, and find that they were preceded by *pains* in the *head*, *back*, pit of the ſtomach, and a febrile ſtate, we may reaſonably conclude that the diſtemper is the *ſmall-pox*.

§ 1248. And this opinion will be confirmed, if in our daily viſits we find the puſtules continue increaſing in bulk, gradually growing white on the tops of them, with a *redneſs* round their *baſis*; and that they are attended with *throbbing* pains, and filling with a *pus*, which is ſuppurated matter.

§ 1249. If we are called to a patient the ſecond day after his decumbiture, or being taken ſick with variolous ſymptoms, and find a multitude of puſtules exceeding ſmall, either very little coloured, or of a very deep colour, we may prognoſticate that his diſtemper will prove one of the worſt ſorts of *ſmall-pox*, and be attended with moſt dangerous ſymptoms.

§ 1250. We ſhould, in order to the forming right notions of ſuppurating puſtules, underſtand what *ſuppuration* or *maturation* is; and how it is occaſioned or produced.

§ 1251. I mean by the *ſuppuration* of any matter, its *putrefaction*, or the change of its ſtate and quality into that we call *pus*.

§ 1252. And every ſuppuration (in any part of the body) is of ſome matter excreted from the blood, and extravaſated, which becomes ſtagnant, and corrupts or putrefies; thus it is in the tumours we call *phlegmons*, or *boils*; and thus in variolous *puſtules*, *whitloes*, and *buboes*.

§ 1253. But every matter or humour excreted from the blood, and extravaſated, will not *ſuppurate*.

§ 1254. If the humours extravaſated be very thin, and its parts minute enough to paſs from the places where they are lodged, partly through the pores of the *epidermis*, and partly through the *vaſa inhalantia*, or returning veſſels, there can be *no* ſuppuration.

§ 1255. And for this reaſon the *morbillous* and divers other ſorts of puſtules never ſuppurate; and watery, lymphatic humours, though *extravaſated* in large quantities, as in the *anaſarca*, and dropſy *aſcites*, do properly not ſuppurate.

§ 1256. It ſeems neceſſary therefore, to the ſuppuration of any humour excreted from the blood, and become ſtagnant, that there be with that humour a certain quantity of the *red* particles of the blood likewiſe extravaſated, and mixed with that humour.

§ 1257. Blood extravaſated *per ſe*, and alſo in mixture with lymphatic humours, will ſuppurate.

The truth of this aſſertion is proved by every *phlegmon*, or *boil*, or *bubo*, or *variolous* or *miliary* puſtule that ſuppurates.

§ 1258. The component parts of every puſtule in the *ſmall-pox*, which ſuppurates, are red particles of blood mixed with lymphatic humours; and particles properly and ſtrictly called *variolous*.

§ 1259. The reaſons of the importance, and advantage to the patient, of the puſtules ſuppurating in the *ſmall-pox*, after they have been formed, and ſubſiſted ſome time, I take to be theſe, viz. that when they ſuppurate, abundantly larger quantities of the morbid humours are excreted from the blood, and carried to the puſtules; and that the very *pain* which attends the *ſuppuration*, as a *ſtimulus*, increaſes the fluxion of the humours to the external ſuperficies of the body, and thereby promotes the recovery of the patient.

§ 1260. The conſideration of theſe things may convince us, that it is neceſſary to preſcribe thoſe *alterative* medicines which may remove the morbid qualities ſubſiſting in the blood, and render the variolous particles minute enough to paſs out of the body in every way of evacuation.

§ 1261. It often happens that the *variolous* puſtules never ſuppurate, and the reaſon hereof is a deficiency in the quantity of the morbid humours excreted to the *puſtules*; and this is always an ill ſymptom, and ſhews, that the morbid humours remain circulating with the blood, whoſe ſeparation from it, and evacuation, is neceſſary to the recovery of the patient.

§ 1262. 4. PUSTULES, which appear *whitiſh*, much like the *variolous*, when in full maturation, is a ſymptom ſometimes appearing on the ſkin; and therefore to be conſidered, though they ſeldom want and ſeldom have the direction of a phyſician; but ſometimes we are conſulted to give our opinion, whether the diſtemper is the *ſmall-pox*, on the account of the reſemblance which the puſtules we are ſpeaking of have to them.

§ 1263. There are two ſorts of theſe puſtules (§ 1262.) viz. the *greater*, and the *leſſer*: the greater are ſomewhat larger than the large puſtules of the *diſtinct ſmall-pox*, and are called the SWINE-POX.

§ 1264. The leſſer ſort are ſomewhat ſmaller than the *variolous*; and are called the CHICKEN-POX.

§ 1265. Theſe PUSTULES are generally very few in number, and are neither preceded by, nor attended, nor followed with ſymptoms of much ſickneſs, or of any threatening ſignification.

§ 1266. If we obſerve the *baſes* of theſe puſtules, we ſhall find a manifeſt difference between them and the *variolous*; becauſe the colour of the *baſes* of theſe is a ſmall, faint, *dull red*; whereas the baſes of the *variolous* are of a ſtronger and more lively red, till their maturation be perfected.

§ 1267. If on examination we find that theſe puſtules were not preceded by variolous ſymptoms, we may affirm that the diſtemper is not the *ſmall-pox*, but what is called the *ſwine-pox*, if the puſtules are of the larger ſort; or the *chicken-pox*, if the puſtules are of the ſmaller ſize.

§ 1268. It is my opinion, that theſe puſtules are *not* to be reckoned *ſuppurating*; becauſe from their firſt appearance (ſo far as I have had the opportunity of obſerving) they have ſeemed to be replete with the ſame ſort of a white humour, and only to increaſe a little in bulk, as the quantity of that humour is increaſed in them.

§ 1269. I am alſo confirmed in this opinion by conſidering that leſſer puſtules, when they *ſuppurate*, are attended with *ſmarting* and *pain*; and give a more ſenſible uneaſineſs to the patient.

§ 1270. I apprehend that a very ſmall proportion of red particles from the blood are excreted to theſe puſtules, much ſmaller than to thoſe properly of the ſuppurating kind; with a greater proportion of lymph, and juſt enough a little to inſpiſſate the lymph, and bring it to the conſiſtence of what we call whey.

§ 1271. It muſt be remembered, that theſe *puſtules* become *dry* by the tranſpiring of their contained matter; which is the reaſon why they do not leave ſuch ſcabs as thoſe *variolous* puſtules do which ſuppurate.

§ 1272. As for the management of patients under this ſymptom, it is generally ſufficient to keep them from external cold; and to give them ſometimes a draught of wine whey, or of *ſage tea*, ſweetened to their palate, &c.

§ 1273. This ſymptom ſometimes, though rarely, happens to adult perſons: it is moſt frequent among children.

§ 1274. 5. Another ſymptom, appearing on the external ſuperficies of the body, are *ſmall* PUSTULES pretty near together, *replete with a thin humour*, and attended with great heat, a redneſs, and ſwelling of the part affected.

§ 1275. Theſe ſmall puſtules ſometimes run together, and form large veſicles or bladders, ſomewhat like thoſe raiſed by *bliſtering plaiſters*; and are attended with, or were preceded immediately by a fever: this diſeaſe is called an ERYSIPELAS, or St. Anthony's Fire.

§ 1276. This eruption (§ 1274.) may be produced on any part of the body, but moſt frequently it happens in the face, and is often attended with a great ſwelling of the *eye-lids*, ſo that the patient cannot open them.

§ 1277. The *eryſipelatous* FEVER I take to be *ſui generis*, ſpecifically different from all other kinds, as the eruption is peculiar to this diſtemper.

§ 1278. I apprehend it is produced partly by a peculiar kind of *acrimony* in the blood, and partly by ſome *viſcid* humours, or particles *too bulky* to paſs eaſily through the minuteſt ſanguine arteries.

§ 1279. For the *ſwelling* of the part affected ſhews that the veſſels of it have been obſtructed and diſtended; which muſt have been occaſioned by *viſcid* humours, or too bulky particles.

§ 1280. The *redneſs* of the parts affected, and the greatneſs of the pain, ſhew both that *red* particles and ſuch as are *acrid* have been excreted from the blood to the ſuperficies affected.

§ 1281. Hence (§ 1278, &c.) we may infer, that ſuch *alterative* medicines as may remove the morbid qualities of the blood are the proper remedies.

§ 1282. And that as to outward applications, nothing *repelling* ſhould be uſed; becauſe they may occaſion the excreted humour in a great meaſure to return inwards, and may prevent any further evacuation of ſuch humour to the part affected; the conſequence of which may be either the increaſe of the fever, or the production of ſome other diſtemper.

§ 1283. We ſhould not adviſe unctuous applications, becauſe they may obſtruct the ſecreting, ſubcutaneous ducts, and hinder the perſpiring of the morbid humours to and through the pores of the *epidermis*;

§ 1284. But ſuch warm, emollient fomentations, as will open the pores of the *epidermis*, and obtund the points of the *acrid* particles, and promote a diſcharge of the morbid humours *ad extra* are proper, and have proved very beneficial: thoſe preſcribed by Dr. Sydenham were of this ſort.

§ 1285. And the following mixture is proper:

℞ *Mucilaginis tenuis rad. althææ* ℥xiv. *ſp. vini rectificati* ℥ii. *m. pro* FOTU *partibus affectis cum pannis laneis bis in die tepidè applicando.*

§ 1286. 6. There are *two* other ſorts of ſymptoms, ſometimes appearing on the ſuperficies of the body which ſhew that the diſeaſe is the PLAGUE. Theſe are BUBOES and CARBUNCLES.

§ 1287. If we are called to any patient afflicted with febrile ſymptoms, and find either *buboes* or *carbuncles* upon him, we know thereby that the diſtemper is the PLAGUE, and we ought to declare it to be ſo.

§ 1288. It is therefore highly neceſſary that we have right notions of theſe dreadful ſymptoms, and be able certainly to tell when they happen. I ſhall therefore conſider them diſtinctly.

§ 1289.

§ 1289. A bubo is a peculiar kind of tumour, ſo called from the Greek word βȣβων, the Latin word ſignified by which is *inguen*, and in Engliſh it denotes the *groin*. So that, according to this ſignification, a *bubo* is a tumour in the groin.

§ 1290. The groins are thoſe parts of the *abdomen* which lie between the thighs (when the body is erect in a ſitting poſture) and the *pubes:* and in thoſe places are many *glandules*, whoſe ſecreting and excreting *tubuli* are large enough to receive and evacuate from the blood a conſiderable quantity of liquid humours in a ſenſible manner, as is evident from the moiſture conſtantly perceived, more or leſs, in thoſe places.

§ 1291. For this reaſon the *groins* may juſtly be reckoned among the *emunctories* of the body; and for the like reaſon the *armpits*, or places under the arms, and the places behind the ears may be ſo accounted, &c.

§ 1292. And in the plague it frequently happens that tumours ariſe in the *groins*, which on the account of their ſituation, as I have obſerved, are called *buboes*.

§ 1293. Theſe ſwellings in the groins, ariſing in perſons who have the plague, very much reſemble the tumour we call a *phlegmon*, or *boil*, and are of an inflammatory and ſuppurating nature like them, and have the like appearances: they are ſmall and hard, and ſomewhat *red* at firſt, and are attended with great pain, which is often throbbing; and as the *maturation* proceeds grow larger, and become ſofter on their tops, where the red colouring ſenſibly abates, when the matter contained in them corrupts, putrifies, or turns into that fluid ſubſtance we call *pus*, or matter ſuppurated.

§ 1294. The like tumours in the plague are produced in the *armpits*, but called *buboes*, becauſe they are of the ſame ſort, produced by the ſame cauſe, and have the ſame properties or qualities, and have the ſame ſignification.

§ 1295. Buboes; that is, the like tumours in the plague; are ſometimes produced behind the ears, and then they are called *parotides*; becauſe they are tumours of thoſe two glands ſituated behind the ears, which are called *parotides*, on the account of their ſituation.

§ 1296. For the name is a compound word, compounded of the Greek prepoſition παρα, *pone, vel juxta*, which ſignifies *behind*, or *near*; and ωτα *aures*, the ears; which glands ſecrete from the blood brought up by the *carotid* arteries great quantities of *ſaliva*, which is continually conveyed into the mouth.

§ 1297. It ſometimes happens, that by incidental, unknown cauſes, and ſometimes by improper applications, theſe tumours (although they have a while appeared) ſubſide again, and vaniſh without coming to a *ſuppuration:* but ſuch an event is generally very unhappy to the patient, and followed with the appearance of more threatening ſymptoms, which terminate in death.

§ 1298. Dr. Diermerbroek takes notice, that *Galen* deſcribes a *bubo* to be an inflammation of ſome glandular parts: which he diſapproves, on the account that theſe tumours ſometimes diſappear, without being inflamed, or ſuppurating. And therefore Dr. Diermerbroek deſcribes a *bubo* to be a ſwelling of the glands ſituated behind the ears, or in the neck, or armpits, or groins.

§ 1299. But the difference of the opinion is of no great moment, and his argument againſt Galen's deſcription ſeems in my apprehenſion to have no great weight. For *variolous* puſtules, *phlegmons*, or boils, are certainly tumours of an inflammatory and ſuppurating nature; and yet it ſometimes happens that theſe ſubſide ſoon after their appearance without coming to a ſuppuration.

§ 1300. However, this is generally agreed, that *buboes* are tumours of the *glandules* ſituated in thoſe places where they appear.

§ 1301. And therefore, if ever we ſhall be called to a patient under an *acute* fever, and find a *tumour* in any of thoſe glandulous parts, viz. the groin, or the armpits, or behind the ears, we are to judge the diſtemper to be the *plague*, and immediately to declare it, and give notice of it to ſome proper magiſtrate.

§ 1302. I would now obſerve, that the conſideration of the parts immediately affected with a *bubo*, will help us to form ſome uſeful notions concerning this ſymptom.

§ 1303. Let us therefore obſerve the following particulars, viz.

1. That to the production of a *bubo* there muſt, as one productive cauſe, be a continued propulſion of morbid blood from the ſanguine arteries into the lymphatic veſſels conſtructed with the glands affected: for without this there could be no ſubſequent inflammation, or increaſe of bulk.

§ 1304. 2. That with the morbid blood propelled into the conſtituent veſſels of the glands affected, there paſſes ſome proportion of lymph.

§ 1305. 3. That when a *bubo* ſuppurates, and the matter either of itſelf forces a vent, or by the aſſiſtance of a SURGEON is diſcharged; the tumour then becomes an *ulcer*, or, as I may call it, an ISSUE, through which an abundance of morbid humours may happily be evacuated from the body for many days.

§ 1306. 4. That a kindly ſuppurating *bubo* is one of the *favourable* ſymptoms happening to a perſon under the *plague*, encouraging in us an hope of his recovery.

§ 1307. 7. There is another terrible ſymptom frequently appearing on the bodies of perſons viſited with the *plague*; and this is called a CARBUNCLE.

§ 1308. A CARBUNCLE is a *flat* indurated tumour, but not very broad, attended with great *inflammation*, extreme heat, and intolerable pain; the fleſh ſeeming as if burnt to a cruſt: the colour is of a duſky or dark *red*, verging to the livid or to the black.

§ 1309. *Carbuncles* are repreſented to have very fiery puſtules round their baſes, and in the middle of them to have a blackiſh SPOT, which is the beginning of a mortification, which increaſes as theſe tumours increaſe.

§ 1310. Theſe tumours do not happen in the places where *buboes* are uſually formed, but in various other parts of the *body*, and never come to ſuppuration.

Sometimes they appear on the *neck*, or *thorax*; ſometimes on the *belly*, or *back*; ſometimes on the *arms*, or *legs*; ſometimes on the *hands* or *feet*, or *fingers* or *toes*; and ſometimes only one or two, and ſometimes more together; and ſometimes only in one, and ſometimes in different parts of the body.

§ 1311. I may add, that the ſame cauſes which produce this ſymptom on the external part of the body may likewiſe produce them on the external ſuperficies, viz. on the membranes of the *oeſophagus*, ſtomach, and bowels, and on the *viſcera*; as variolous *puſtules* are ſometimes formed on thoſe internal parts, &c.

§ 1312. The cauſes productive of this dreadful ſymptom ſeem, in my apprehenſion, to be *cauſtic particles* of matter diffuſed in the blood, and propelled from the ſanguine ſubcutaneous arteries through the lymphatic arteries in the places where theſe tumours riſe.

§ 1313. By the acceſſion of ſuch *cauſtic* particles (with ſome blood, and ſome lymph) to the parts tumified, the tumour increaſes, and the *epidermis*, and the parts ſubjacent, are contracted, corroded, and as it were burnt to a coal, or a cruſt, or *eſcar*, &c. The parts tumified are mortified, and muſt be ſeparated, &c.

§ 1314. If in attending on any patient under an *acute* fever, we find one or more of theſe tumours, we are to conclude that the diſtemper is the *plague*; and for the ſake of the PUBLIC we ought not to conceal it, but give information of it to ſuch perſons as ought to be informed thereof.

END of LECTURE X.

LECTURE XI.

On the various kinds of eruptions on the external ſuperficies of the body in chronical diſtempers: and on nervous ſymptoms.

§ 1315. II. I Shall now conſider thoſe morbid SYMPTOMS which appear on the *external* ſuperficies of the body in *chronical* diſtempers; and the principal and moſt important of this claſs are the following, viz.

1. Thoſe *puſtules* which are peculiarly attended with great *itching*; on which account the diſtemper is called the ITCH.

§ 1316. Theſe puſtules are ſmall, look clear, and are replete with a very *thin*, or *watery*, and *ſalt* humour; and are a little red at their baſis.

§ 1317. They are produced in moſt parts of the body, but chiefly on and between the *fingers*, and on the *hands*, *arms*, *hams*, *thighs*, and ſides of the belly.

§ 1318. They are of different ſizes not only in different but alſo in the ſame body; ſome are larger, and ſome ſmaller. When theſe are broke, a little thin *ichor*, or a ſalt lymph, iſſues from them; and the parts of the *epidermis*, which incloſed the humour, preſently dries, and adheres to the ſkin as a thin ſcab.

§ 1319. This ſymptom may eaſily be propagated by *infection*, as multitudes of inſtances daily prove.

§ 1320. Some think that this diſeaſe is produced by *animalcules* tranſmitted from the body of the diſeaſed, through the *epidermis* of the infected perſon.

§ 1321. Mr. H. BAKER, F. R. S. (in his book intituled, *The Microſcope made eaſy*) repreſents the ITCH as owing to little *inſects* under the *cuticula.*

§ 1322. And in ſupport of this opinion relates (from the Philoſophical Tranſactions) that Dr. BONONIO diſcovered by the microſcope a very minute *animal* in a very ſmall white globule, that was ſqueezed from a place ſcabbed over in one who had the *itch:* and that in ſhape it reſembled a tortoiſe, and was very nimble in its *motion*, having ſix legs and a ſharp head.

§ 1323. And relates, that he repeated the experiment on *itchy* perſons of all *ages*, *ſexes*, and *complexions*; and at all ſeaſons of the year; and that he conſtantly found the ſame *animalcules* in *moſt* [which expreſſion implies that he did not find them in all] of the *watery* puſtules.

§ 1324. And he further relates, that Dr. BONONIO obſerved one of them drop a *little*, *oblong*, *white* egg; which (he adds) proves them generated like other creatures from a *male* and *female.*

§ 1325. It is granted, that *animalcules* have been found in ſome watery puſtules of perſons that have had the *itch*;

§ 1326. But it does not hence follow, that thoſe animalcules were the cauſe of thoſe puſtules called the itch.

§ 1327. In my apprehenſion it is certain that they are not; becauſe ſeveral of the puſtules of the itch have no animalcule in them: and how are theſe produced, if not by *ſaline* particles excreted from the blood, and propelled to the *epidermis*, diluted with a certain proportion or quantity of a thin lymph?

§ 1328. We meet with animalcules in dead and putrefying carcaſes, or fleſh of animals; but can we hence reaſonably conclude, that they were the cauſe of the death, or of the putrefaction of thoſe bodies? No, ſurely.

§ 1329. Beſides, if we conſider the manner of the generation of animal bodies, viz. by the copulation of male and female; we muſt allow time after the copulation for the female to have the *ovula* grow to their maturity, and voided out of her body:

§ 1330. And time, and various concurring cauſes muſt be allowed for bringing theſe *ovula* into *animalcula*:

§ 1331. And then there muſt be time for thoſe *animalcula* to grow to their maturity, and a capacity of copulating, and producing of more *ovula.*

§ 1332. Thus it is in the production of all ſorts of *inſects* we are acquainted with.

§ 1333. But the diſtemper called the itch is produced in much leſs time than is neceſſary to the production of ſeveral generations of any one ſort of inſects.

§ 1334. It ſeems to me a probable opinion, that the air has always intermixed with it *ovula* of all ſorts, of the minuteſt inſects that have an exiſtence; and that when theſe *ovula* are with the air conveyed into a proper *humid* SUBSTANCE, they grow, and become *animalcules.*

§ 1335. Hence, as I apprehend, it is that ſome *animalcules* are produced in *pepper water*, others in *rain water*, others in a *ſoft paſte*, others in the *mucous* matter adhering to the teeth of many people; and others called *mites*, in ſome ſorts of old cheeſe.

§ 1336. Some animalcules are produced in *vinegar*, yet *vinegar* will deſtroy other ſorts of animalcules, e. g. that ſort which is produced in the mucous matter about the teeth, &c.

§ 1337. That *animalcules* are found in many of the morbid puſtules of perſons who have the *itch*, is an evidence indeed that the *ſaline humour* excreted to thoſe puſtules, is a ſort of fluid matter in which they may be produced, but no argument that they are the cauſe of that diſtemper.

§ 1338. Some imagine that the PLAGUE and other contagious diſeaſes are produced and propagated by inſects interſperſed in the air.

§ 1339. A few things, rightly conſidered, may ſufficiently ſhew that this opinion is entirely groundleſs, e. g.

1. That there never has been produced any facts proper to ſupport it.

2. That the *plague* and *ſmall-pox* have been often produced in healthful bodies, without any contact between the diſeaſed perſon and the perſon infected by him: that ſometimes the contagious particles, which have infected another, have been emitted from the lungs of the diſeaſed with their breath.

§ 1340. There have been divers inſtances of perſons that have been infected with the *plague* by the breath of another who had that diſtemper, and at the time of infecting, unknown to others, and unknown to themſelves.

§ 1341. And there have been inſtances of perſons who have fallen ſick of the *ſmall-pox* the ſame way.

§ 1342. Now thoſe infectious particles, emitted from the lungs of the diſeaſed, ſuppoſing them to be *animalcula*, did pre-exiſt in the blood of the diſeaſed, and circulate with it; and were ſeparated from the blood flowing through the capillary branches of the *pulmonary artery*, and ſeparated from it into the lymphatic arteries; and through them into the cavities of the air-veſicles of the lungs, and then mixed with the breath.

§ 1343. And this ſuppoſition implies, that the ſtreams of blood in the minuteſt ſanguine arteries are fuller of inſects than any river has been found filled with fiſh; and that theſe infecting inſects, excreted from the blood, are of ſuch a minuteneſs as not to be capable of becoming viſible by any microſcope, unleſs collected into a multitude.

§ 1344. I apprehend, that no microſcope can render viſible the minuteſt particles that paſs from the minute lymphatic arteries ſingly; what is viſible is a *congeries* of many particles cloſe together.

§ 1345. A ſmall quantity of *infecting* matter, or of *variolous effluvia*, tranſmitted into the blood of a healthy body, may produce the *ſmall-pox* of the confluent kind, or the diſtinct ſort with a multitude of puſtules; as is evident by the effects of *inoculation.*

1346. It is in the blood that the *infection* of any fever acts, tranſmitting part of it into the nature of the infecting matter, and rendering the body a fountain of infection, while the diſtemper ſubſiſts in it; which diſtemper has a denomination according to the nature of the infection, e. g. the *ſmall-pox*, or the *plague*, &c.

§ 1347. And conſequently, on the hypotheſis that the *plague*, and *ſmall-pox*, and other contagious diſtempers are produced by *inſects* diſperſed in the air, it would follow,

1. That myriads of inſects are generated every hour in the blood of perſons ſick of the *ſmall-pox*, or *plague*, &c.

2. That myriads of theſe inſects paſs from the blood to and through the kidneys; and from the blood into the cavity of the inteſtines, and come away with the ſtools.

3. And from the blood through minute lymphatic veſſels into the air-veſicles of the lungs, and out of the body with the breath.

4. And from the blood through the minute, cutaneous veſſels, and perſpiratory ducts termi-

nating in the *cutis*; for by all theſe ways infectious *effluvia* paſs out of the body under the *ſmall-pox.*

§ 1348. I may further obſerve, that if contagious diſeaſes are produced by *inſects* diffuſed in the air, no *barriers* or means to prevent commerce, or the admiſſion of perſons and goods from towns infected with the plague, or ſmall-pox, could prove of any ſervice.

§ 1349. Neither could it at all contribute to the ſafety of families, to ſhut themſelves up in their houſes in the time of a *plague*; becauſe theſe methods could not prevent the current or courſe of the air paſſing over the lines of barriers, nor hinder the entrance of the air, or *animalcula* in it, into the houſes ſhut up.

§ 1350. But lines of barrier have been of great ſervice in preſerving towns and countries from the plague, when it has been in towns near them; and families, in cities viſited with the plague, have been preſerved in ſafety from it, by means of ſhutting themſelves up in their houſes.

§ 1351. But theſe facts could not have happened, if the contagion was propagated by *inſects*, or ſmall *animalcules*, floating in the AIR, and carried along with its current; and therefore theſe facts prove the opinion of the production and propagation of *contagious* diſtempers by inſects, not only to be groundleſs but falſe.

§ 1352. I may add, that if the *ſmall-pox*, or plague, or other contagious diſeaſes, were produced by *animalcules* conveyed into the blood, and which there generate and multiply their *ſpecies*, as fiſhes put into a river, what would bleeding do towards deſtroying animalcules in the blood? No more than letting out ſome of the water in a canal would do to the deſtruction of the fiſh in it. What would purging do? No more towards the cure of the ſick than bleeding.

§ 1353. It appears to me that the diſtemper we call the ITCH, is produced by a peculiar kind of ſcorbutic *ſalts* ſecreted from the blood, and propelled with a thin lymph to the *epidermis*, in thoſe places where the puſtules ariſe.

§ 1354. And when a *cutaneous* diſeaſe is propagated by *infection*, I apprehend that the manner of it is thus, viz. that the *ſaline particles*, which paſs from the diſeaſed body into the body of another, and there produce the diſtemper, do ſo without any lymph, and enter the *vaſa inhalantia* of the infected perſon, and are carried through them into the blood, and there *aſſimilate* parts of it into their own nature and quality; and which, when excreted to the *ſuperficies* of the body infected, produce puſtules of the ſame ſort with thoſe on the body of the perſon from whom the infection came.

§ 1355. The conſideration hereof convinces me, that the morbid *ſalts* in different cutaneous diſeaſes are *ſui generis*, of their own peculiar nature; and ſpecifically different in each ſort of them.

§ 1356. The curative indications evidently are two, viz. 1. By proper *alterative* medicines to free the blood from that *ſaline* quality on which the eruption depends; and, 2. By proper *alterative* and external applications, to change the figure and texture of the ſaline *particles* excreted under the *epidermis*; that ſo, if any of them are abſorbed by the *vaſa inhalantia*, and return into the blood, they may not be capable of tranſmuting any more parts of it into their primary nature.

§ 1357. This appears to me the moſt rational and the moſt effectual method for eradicating the diſeaſe.

§ 1358. But *bleeding* and *purging*, or any other *evacuants* to diminiſh the quantity of the animal fluids, are improper in the cure of cutaneous diſeaſes when there is no exceſs in any of them.

§ 1359. They may, by forcing a *revulſion* from the exterior *ſuperficies* of the body, haſten the diſappearing of thoſe *puſtules*; but not to the advantage of the health of the patient: for what advantage can it be to have any of thoſe ſalts returned into the blood: it may occaſion the diſtemper to break out again, or produce ſome other morbid effects within the body.

§ 1360. And let me obſerve, that when there is no exceſs in the quantity of the animal fluids, the leſſening their quantity will certainly do harm, and will make it leſs than it ought to be.

§ 1361. Such needleſs and imprudent *evacuations*, therefore, unavoidably will bring one of the general cauſes of diſeaſes into EXISTENCE; and morbid effects may follow thereupon.

§ 1362. I can with truth affirm, from experience through the courſe of many years practice, that there are methods and medicines ſafe and effectual for the cure of this and the other cutaneous diſtempers, which I ſhall relate.

§ 1363. 2. Another morbid appearance on the ſkin is called the PSORA, or SCAB. This is a SCABBINESS, which ſometimes ſpreads all over the body.

§ 1364. There is commonly a *hardneſs* of the ſkin, and a reddiſh colouring, where the *ſcabbineſs* appears: and in thoſe places puſtules ariſe, which ſometimes break and diſcharge a *ſanies*, or a filthy matter, and then ſcab. And in others the puſtules diſcharge no matter; but the matter contained in them dries, and the puſtules turn into ſcabs.

§ 1365. This *ſcabbineſs*, or *pſora*, is diſtinguiſhed into two ſorts, viz the *moiſt*, and the *dry*. The former of theſe is more eaſily cured than the other.

§ 1366. This (§ 1365.) may be diſtinguiſhed from the itch; 1. By the conſiſtence of the matter contained in the puſtules: thoſe of the *itch* are replete only with a *thin*, clear ſort of lymph; but theſe with a *thicker*, or more *ſpiſſid* humour. 2. In the *itch*, the puſtules are commonly more diſtant; in this diſeaſe, ſeveral are cloſer together, and unite to the forming of a ſcab. 3. In the *itch* the ſcabs are thinner than in this.

§ 1367. In the moiſt kind of the *pſora* there is more of the lymphatic humours, and a greater proportion of red particles, excreted with the ſcorbutic *ſalts* to the puſtules, and thoſe *ſalts* are not ſo compact as in the dry ſort of ſcab; and conſequently are more eaſily attenuated by *diluents*, and their texture altered by ſuitable medicines, than in the *dry* ſort.

§ 1368. We may well argue from a manifeſt difference of effects, that there is a difference in the cauſes which produced them; and therefore we may conclude, that the different cutaneous diſtempers, which occur to our management, proceed from *ſalts* of a different figure and quality.

§ 1369. It muſt be acknowledged, that we cannot form any certain ideas of the different figures, ſhapes, or minuteneſs of the different kinds of *ſcorbutic* ſalts.

§ 1370. But I may affirm, that the good God has made known to us medicines which are proper; and which, with his bleſſing, have proved, and will prove, effectual to alter the quality of every kind of *ſcorbutic ſalts*, and to cure the diſtempers produced by them.

§ 1370.

§ 1371. 3. The IMPETIGO, another morbid ſymptom appearing on the external *ſuperficies* of the body, is when little LUMPS (as they ſeem to the feeling) or *red* and *denſe* PUSTULES are produced in the *cutis*; ſometimes few, ſometimes many together, and ſpread into a *cluſter* nearly of a *circular form:* theſe puſtules frequently are of a *reddiſh brown* colour, and at times attended with great *itching*; and if they are ſcratched, SCALES fall off, and a thin *ichor* ouzes out; but the puſtules ſoon become dry, and covered with a *ſcaly* ſort of incruſtation, which remains till it is rubbed or ſcratched away, &c.

This ſymptom (§ 1370.) is produced ſometimes on the *arms*, or *hands*, ſometimes on the legs or thighs, near the groin.

§ 1372. 4. The HERPES, or tetter, are *puſtules* which ariſe ſingly; ſometimes more, ſometimes fewer, look red and inflamed round their baſes; and above the redneſs appearing whitiſh or yellowiſh, and terminating in a point at their top; and when theſe break, and their contained matter is let out, they ſoon become dry.

§ 1373. 5. The SERPIGO is another ſort of a tettery humour appearing on the ſkin; which is, when red puſtules, *ſmaller* than the laſt-mentioned (§ 1371.), are produced thick together, nearly in the form of a CIRCLE, and attended with ſmarting, or pain, and itching. Theſe in Engliſh are called a *ringworm*; and they never ſuppurate; but upon *ſcratching*, a thin lymphatic humour iſſues from them.

§ 1374. 6. Another cutaneous ſymptom is called HERPES MILIARIS; when a multitude of very minute puſtules appear in ſeveral parts of the body, in ſize and colour ſomewhat reſembling *millet-ſeeds*, attended with pain or itching.

§ 1375. When this ſymptom happens to perſons polluted wiſh a venereal diſtemper, the cure of it is more difficult.

§ 1376. 7. There is another morbid ſymptom on the ſkin called HERPES EXEDENS; when ſmall red *puſtules* appear, which look much inflamed, and are attended with ITCHING, and *ulcerate*; diſcovering a *corroſive* humour, which ſpreads; deſtroying the adjacent parts of the *epidermis*, and penetrating downwards into the *cutis*.

§ 1377. This eruption (§ 1376.) happens, when a *corroding* humour has been propelled from the ſubcutaneous, ſanguine arteries, through the lymphatic veſſels, into the cutaneous *glandules*, where it ſeems to be retained; its particles not being minute enough to paſs off through the pores of the *epidermis*, and being retained, the corroding particles *eat* and deſtroy the next adjacent parts, till they are diſlodged and evacuated, or their figure and texture altered.

§ 1378. Theſe cutaneous diſeaſes ſeem to be produced by peculiar ſcorbutic ſalts ſubſiſting in the blood; and the *puſtules*, which appear to our view, conſiſt of ſaline particles excreted from the blood, with a certain proportion of lymph.

§ 1379. 8. The FURFURATIO, or *ſcurf*. This moſt frequently happens on the head, among the hair; ſometimes on the eyebrows among the hair, and chiefly to children.

§ 1380. It is ſometimes in colour *whitiſh*, and ſometimes verging towards the *yellow*; but always different from the natural colour of the ſkin. It is very obvious to the ſight; and if the parts affected are ſcratched or ſcraped, a ſort of bran-like ſcales fall off from it; and on this account, in the Latin tongue, it is called *furfuratio*, from the word *furfur*, which ſignifies bran; and in our tongue it is called *ſcurf*, or *dandraff*.

§ 1381. It is ſometimes thicker, and ſometimes thinner; and if it be all rubbed off, or ſeparated from the ſkin, yet freſh *ſcurf* commonly ariſes again, till the *internal* cauſe be removed.

§ 1382. It is a naſty appearance, and ſome think it proceeds only from a neglect of cleanlineſs, a want of care to keep the parts affected clean.

§ 1383. Indeed, the neglect of keeping the head clean may contribute to the production of it; becauſe filth, ſuffered to lie on the ſkin, ſtops the pores of the *epidermis*, and prevents the tranſpiring of the *ſaline* particles through them.

§ 1384. The productive cauſe of it (§ 1379.) ſeems to be the propulſion of ſaline particles to the extremities of the excretory ducts under the *epidermis*; where remaining *without lymph*, and without red particles from the blood, they cannot form puſtules, but quite eat away many of the parts by which the *epidermis* adhered to the *cutis*, and they mortify this external membrane, or *cuticula*, and bring it into that ſtate which we call *ſcurf*, or *dandraff*.

§ 1385. 9. The LEPRA, or LEPROSY, is another cutaneous diſeaſe which ſometimes happens on the ſuperficies of the body; and in the places where it appears, the parts affected are ſomewhat *elevated*, and look *white* and *ſcaly*; and if *rubbed*, white ſcales fall off.

§ 1386. If the white ſcales are ſeparated, the ſubjacent parts appear very *red*, and of an inflamed colour, but ſomewhat *moiſt*; and new white ſcales are ſoon formed again by the *evaporation* of the humid particles excreted to the ſurface of thoſe morbid parts.

§ 1387. This ſymptom (§ 1385.) is ſometimes attended with ſmarting pains; and ſometimes with *itching*.

§ 1388. And the *leprous* SPOTS are of different ſizes, and of different figures. I have ſeen ſome *round*, ſome *oblong*, ſome no broader than a ſilver twopence, ſome an inch or more in extent. And I have ſeen many of the leprous ſpots on the head, ſometimes on the arms, *legs*, &c.

§ 1389. They ſeem to be produced by a peculiar kind of ſcorbutic *ſalts* in the blood excreted to the leprous ſpots.

§ 1390. And the *leprous* SPOTS being *elevated* above the *clear* natural ſkin makes me apprehend that the *cutaneous* GLANDS and veſſels are affected, and diſtended with the *leprous* humour, &c.

§ 1391. 10. The ESSERE is a *ſudden* ERUPTION of *ſmall*, *hard tubercles*, attended with very uneaſy ſenſations, as if the perſon had been ſtung with *nettles*, or *bees*, or bit with *gnats*; and if they happen in the latter end of the ſummer, ſome call them harveſt bumps.

§ 1392. Theſe generally continue but a little while; and without the aſſiſtance of any medicines *ſpontaneouſly* diſappear again;

§ 1393. And therefore do not require the conſideration of the phyſician.

§ 1394. 11. The SCALL'D HEAD frequently happens to infants and children. This is a ſort of *ſcabbineſs* on their heads, vulgarly called a *ſcall'd head*, I ſuppoſe from ſome reſemblance it may have to the appearance of a part that is much ſcalded with boiling liquor.

§ 1395. The head is covered with *whitiſh*, *dry*, and *ſcurfy* SCABS; underneath which are running ulcers: the matter of which by the heat of the head becomes dry, or turned into SCABS; which are nothing but the matter diſcharged from the ſubjacent *ulcers indurated* by the *flying off* of the moſt aqueous and volatile parts of the humour, which make a very offenſive ſmell.

§ 1395. The productive cauſe is a *ſaline* humour detained in the cutaneous *glands* of the parts affected, where it produces many ſmall *ulcers*; which, when their *ſcabby covering* is removed, appear like *grains*, or the ſeeds in figs cut tranſverſely:

§ 1396. And if the humour is very *corroſive*, when the ſcabs are ſeparated from the ſubjacent parts, there appear little hollowneſſes, ſomewhat ſimilar to thoſe made by the little *worm* called *tinea* in books and cloaths. On which account this morbid ſymptom, in *Latin*, has the name TINEA.

§ 1397. Thus I have given a brief account of the principal morbid ſymptoms which appear on the external *ſuperficies* of the body in chronical diſeaſes, and a deſcription of them by which they may be known.

§ 1398. And I think it is pretty manifeſt, that moſt of them are the effects of ſome kind of SALT too abundant in the blood; and that a *ſaline acrimony* is the *morbid quality* productive of them, and on which they depend;

§ 1399. And conſequently, that proper *alterative* medicines, *internal* and *external*, are the ſuitable remedies; and that *bleeding* and *purging* are improper in cutaneous diſeaſes.

§ 1400. Indeed, if there be an exceſs in the quantity of the fluids of perſons under any of the ſymptoms mentioned, thoſe EVACUATIONS ſhould be made which are needful to take off the exceſs; but not on the account that there is a morbid quality in them:

§ 1401. For thoſe external diſorders may be happily removed without *bleeding* or *purging*.

§ 1402. XI. The *eleventh* and laſt claſs of morbid ſymptoms to be conſidered, are thoſe of the NERVOUS SYSTEM.

§ 1403. The NERVOUS SYMPTOMS I ſhall diſcourſe on are theſe following, viz.

1. SPASMS, or CRAMPS.
2. TREMELINGS, SHAKINGS, and SHIVERINGS.
3. SUBSULTUS TENDINUM.
4. CONVULSIONS.
5. FAINTINGS.
6. HYSTERIC FITS.
7. SHIVERING RESPIRATION; and
8. COUGH.

§ 1404. I may obſerve, that under all theſe SYMPTOMS, the *muſcles*, more or fewer, are *involuntarily* contracted, and relaxed, or moved; and therefore it may contribute to a clearer knowledge of the ſymptoms mentioned, if we underſtand by what cauſes or means any muſcles become contracted, or relaxed, or involuntarily moved.

§ 1405. And that we may form juſt notions of the *nervous* ſymptoms, and be better able to deduce the curative indications for the removing them, I ſhall premiſe ſome obſervations concerning the muſcles, their different ſtates and motions, viz.

§ 1406. Obſ. 1. That a muſcle is a fleſhy, organical part of the body, conſiſting principally of three general ſeries of veſſels, viz. the *ſanguine*, *lymphatic*, and *nervous*; all repleniſhed with their own proper fluids, and incloſed with a firm tendinous, or with a lax fibrous membrane; or partly with one, and partly with the other.

§ 1407. Obſ. 2. That the muſcles are the ſubjects either of the *ſpontaneous* and vital motions, (ſuch are thoſe of the heart and arteries) or of the *voluntary* motions.

§ 1408. Obſ. 3. That all the muſcles, which are the proper ſubjects of *voluntary* motions, are nevertheleſs liable by various incidental cauſes to be *involuntarily* moved. This is demonſtrated by all the *cramps* and *convulſions* which happen to human bodies.

§ 1409. Obſ. 4. That all the muſcular fibres, and all the veſſels (except the nerves) which enter the ſtructure of a muſcle, have a CONTRACTILE quality. This propoſition is evident, becauſe the fibres, arteries, and veins being cut, contract themſelves, their conſtituent parts run cloſer together, and their lengths in proportion decreaſe.

§ 1410. Obſ. 5. That the nerves have *no contractile* power, or property. This has appeared by a critical examination, and by careful experiments, made by the late Dr. ALEXANDER STUART.

§ 1411. Obſ. 6. That the muſcular fibres and veſſels will contract, if there be not a ſufficient force to prevent their doing ſo.

§ 1412. Obſ. 7. That all the muſcular fibres, and all the *ſanguine* and *lymphatic* veſſels, are likewiſe *diſtractile*; that is, they are capable of being *extended*, or of having their lengths increaſed, without breaking.

§ 1413. Obſ. 8. That every muſcle is in one or other of theſe three following conditions, viz. either, 1. It is in *æquilibrio* with its *antagoniſt* muſcle; that is, in a middle ſtate between contraction and extenſion; or, 2. It is *contracted*; or, 3. It is *extended*.

§ 1414. Obſ. 9. That the muſcles may be ſaid to be in *æquilibrio*, when the antagoniſt muſcles are equally full, or equally empty of their fluids.

§ 1415. Obſ. 10. That the more the veſſels of a muſcle are filled with their fluids, the nearer will the tendons of it be brought together; and conſequently the muſcle will become ſhorter;

that is, it will be *contracted*, in proportion to the quantity of fluids in it.

§ 1416. Obſ. 11. That an influx of fluid into the veſſels of a muſcle, greater than is needful to keep it in *æquilibrio*, will produce a *contraction* of it; which will be greater or leſſer as the quantity of the augmented influx is greater or leſſer.

§ 1417. Obſ. 12. That the contraction of a muſcle, by means of an augmented influx of fluid into the veſſels of it, will produce a *relaxation* or extenſion of its antagoniſt muſcle, which will be proportional to the contraction of the other.

§ 1418. Obſ. 13. That an influx of fluid into the veſſels of a muſcle *leſs* than is neceſſary to keep it in *æquilibrio* will occaſion a *relaxation* or *extenſion* of it; which will be greater or leſſer as the deficiency of the influx is greater or leſſer.

§ 1419. Obſ. 14. That the relaxation or extenſion of a muſcle, by means of a *deficient* influx of fluid into the veſſels of it, will occaſion a *contraction* of the antagoniſt muſcle, which will be proportional to the *extenſion* of the other.

§ 1420. Obſ 15. That therefore the *contraction*, or in other words the *convulſion* of a muſcle, and ſo the motions of it, whether quicker or ſlower, muſt be produced one or other of theſe two ways, viz. either, 1. By an *augmented* influx of fluid into the veſſels which compoſe it; or, 2. By a *deficient* influx of fluid into its antagoniſt muſcle.

§ 1421. It is acknowledged that *convulſions*, or involuntary motions, may be produced in bodies where there is neither exceſs nor deficiency in the quantity of the fluids; as it happens when a perſon is *tickled :*

But that *tickling* occaſions either a greater influx of fluids into the muſcles *contracted*, or a deficient influx of fluids into the muſcles relaxed.

And if *acrid* particles can produce convulſions, it muſt be in the ſame manner that tickling does it.

But *acrid* particles, when they are brought to contact with the extremities of the feeling nerves, do excite pain, and not convulſions.

This is evident from the many pains which happen without convulſions attending them, or conſequent to them, &c.

§ 1422. Obſ. 16. That therefore all morbid *contractions*, or *convulſions*, of the muſcles, and all *relaxations* of them, and all involuntary motions of them, muſt proceed either, 1. From REPLETION; that is, too great a quantity of the animal fluids; or, 2. From DEPLETION; that is, too little a quantity of thoſe fluids.

§ 1423. This theory (§ 1422.) which is grounded on facts, correſponds with the ſentiments of HIPPOCRATES, who ſays, Σπασμος γίνεται ἢ υποπληρωσιος, ἢ κενωσιος, οὕτω δε και λυγμος, that is, *convulſions* and *hiccoughs* proceed either from *repletion* or *depletion.*

§ 1424. Obſ. 17. That thoſe morbid *contractions*, and *relaxations*, and *involuntary* motions of the muſcles, which happen in *plethoric* bodies, we have reaſon to think, reſult from *repletion.* They cannot be produced by *depletion* in bodies whoſe fluids exceed in quantity; therefore they muſt proceed from repletion.

§ 1425. And in ſuch caſes the *curative* indications will lead us to make proper *evacuations*; by *bleeding*, if there be an exceſs in the quantity of the blood; and by *urine*, or *ſtool*, or *inſenſible perſpiration*, as this or that of the other fluids is too much in quantity.

§ 1426. Obſ. 18. That thoſe morbid *contractions*, and *relaxations*, and *involuntary* motions of the muſcles, which happen in bodies after great *hæ-*

morrhages, or other *quick* and *exceſſive evacuations*, or after a fever, or any other diſeaſe, has greatly diminiſhed and waſted the animal fluids, are occaſioned by DEPLETION; that is, by a deficient influx of fluid into the veſſels of the muſcles affected.

§ 1427. In theſe caſes the *curative indications* are, to *nouriſh* and enrich the blood by a *cordial diet* of eaſy digeſtion; and to preſcribe thoſe ſmooth and ſoft *cordial* medicines, which may help to ſupply the deficiencies of the *nervous* fluid.

§ 1428. Thus far we have obtained a knowledge of the cauſes in general, which immediately produce thoſe morbid ſymptoms we call *nervous*, viz. influxes of fluid into the veſſels of the muſcles contracted, where ſuch influxes ſhould not have happened; and the *abſence* of influxes of fluid into the veſſels of the muſcles relaxed, when they are wanted in them.

§ 1429. Some queſtions may here ariſe deſerving notice; e. g. Are not the morbid ſymptoms, mentioned as *nervous*, properly ſymptoms of the muſcles? Are they not of muſcles contracted, when they ſhould not be contracted? Or of muſcles relaxed and extended, which ſhould not be ſo? Or of muſcles when they ſhould not be moved? Or of muſcles in a fixed ſtate, and without motion, when they ſhould not be ſo? and therefore, Should not the ſymptoms be called *muſcular*, rather than nervous?

§ 1430. To theſe queſtions it may be anſwered, That all motions of the muſcles are performed by means of the NERVES: all *voluntary* motions are performed in conſequence of the determinations of a man's will; and thoſe acts of the will are the acts of his intelligent ſpirit, which ſomehow acts on thoſe *nerves* which proceed from the *cerebrum* or greater brain: but how they act upon the nerves to produce the intended motions; how the will ſometimes affects the nerves which go to the right hand or to the left; and the nerves that go to this or that finger; and the nerves which go to the various other parts of the body; and ſometimes impreſſes and influences only *one* or *two*, or many nerves; as when a man plays on a ſpinnet or organ, and performs a great variety of different motions in various actions of life, I confeſs, is beyond my comprehenſion.

§ 1431. Theſe are myſteries I cannot unfold, and queſtions I am not able to anſwer.

§ 1432. But I may obſerve to you, that if a nerve which goes to any muſcle be cut aſunder, that muſcle is deprived of motion, or rendered incapable of being moved by any act of the will; though all the ſanguine *arteries*, and *veins*, and *lymphatic* veſſels, wherewith the muſcle is contracted, remain unwounded.

§ 1433. This demonſtrates that the NERVES neceſſarily act (in being acted upon by the intelligent ſpirit of man) in the production of all the *voluntary* motions of the muſcles; and that they are either the efficient or inſtrumental cauſe of all the *contractions* and *motions* of the muſcles.

§ 1434. The conſideration of theſe things may convince us, as to the ſymptoms to be diſcourſed on, that the muſcles under them are *recipients* of morbid effects; and that the morbid ſtate of the muſcles is derived from the NERVES ſomehow acting upon them, or in them, when they ſhould not do ſo; or from the nerves not acting, or not being acted, when they ought to be ſo.

§ 1435. Theſe things conſidered may ſatisfy us that the morbid ſymptoms contained in my laſt claſs may fitly be called NERVOUS.

§ 1436. Theſe things premiſed, I ſhall now examine the nature of the nervous ſymptoms mentioned above, (§ 1403.) viz.

1. SPASMS, or CRAMPS.
2. TREMBLINGS, SHIVERINGS, and SHAKINGS.
3. SUBSULTUS TENDINUM.
4. CONVULSIONS.
5. FAINTINGS.
6. HYSTERIC FITS.
7. SHIVERING RESPIRATION; and
8. The COUGH.

§ 1437. Under all theſe ſymptoms the NERVES are more immediately affected; and the muſcles, more or fewer of them, are *involuntarily* contracted, and relaxed, or moved.

§ 1438. And (as I propoſe to treat of the morbid SYMPTOMS of the nerves in the order they have been mentioned),

I. Of SPASMS, or CRAMPS.

I mean by a *ſpaſm*, or *cramp*, a violent and exceeding painful contraction of ſome muſcle, which continues ſome time: moſt of the *muſcles* are capable of ſuffering this *ſymptom*.

§ 1439. But moſt frequently it happens in ſome muſcle of the *thighs*, *legs*, *feet*, *toes*, or *fingers*. Sometimes it happens in ſome muſcle of the *belly*, or *ſides*; but wherever it happens, it proceeds from the ſame cauſe, and may be cured by the ſame methods and remedies.

§ 1440. This ſymptom is more common to bodies under *chronical* diſorders than in acute diſeaſes.

§ 1441. It will be proper to conſider what is the ſtate of the muſcle under this ſymptom; which will lead us into the right way for removing it.

§ 1442. Let us therefore obſerve, 1. That a muſcle, which has the *cramp*, is under a much greater contraction than any *voluntary motion* naturally puts it into; and conſequently, that all its veſſels are proportionally fuller of fluid.

§ 1443. 2. That as the ſanguine arteries are vaſtly too much diſtended with blood, ſo the diſtending blood preſſes more violently againſt the extremities of the nerves in the coats of thoſe arteries; and indeed, there is a violent preſſure againſt the extremities of all the nerves, which terminate in that muſcle.

§ 1444. I am confirmed in this opinion, by conſidering that the pain *ceaſes* immediately upon *emptying* the veſſels (of the muſcle contracted) of the exceeding quantity of fluids that was in them; that is, upon the removal of the too great preſſure againſt the extremities of the nerves, affected with pain.

§ 1445. The *curative* indication, therefore, is to procure a *reflux* of blood from the *turgid* and contracted muſcle, and bring it to an *æquilibrium* with its antagoniſt muſcle; and then the pain ceaſes.

§ 1446. The methods and remedies for this purpoſe are to be related in their proper place.

§ 1447. II. TREMBLINGS, SHIVERINGS, or SHAKINGS, the next ſymptom, are in fact very quick MOTIONS of the muſcles; in which the *muſcles* are *alternately* with their antagoniſts *contracted*, and *relaxed*, or extended; and with greater or leſſer celerity, as the motions are more or leſs quick.

§ 1448. I do not apprehend there is any great difference between the three ſorts of motions mentioned, except in degree.

§ 1449. The motions in *trembling* ſeem to be the quickeſt; in conſequence of which the contractions and extenſions of the muſcles under them are the leaſt; and in SHIVERINGS, as the motions are not altogether ſo quick as in tremblings, ſo the contractions and extenſions of the muſcles muſt be ſomewhat greater; but in SHAKINGS, the diſtances between the motions are ſenſibly greater, and ſo are the contractions of the muſcles, and ſometimes to a violent degree.

§ 1450. Theſe ſymptoms happen ſometimes in the *beginning of fevers*; and it muſt be obſerved, that then the pulſe is *ſlow*, and very *weak*; and that the vital heat (no leſs than the pulſe) is ſunk much below the ſtandard of health.

§ 1451. We may hence conclude, that the courſe of the blood through the capillary ſanguine arteries is obſtructed, or rendered difficult and ſlow; and conſequently, that a reſiſtance is made to the contractions and motions of the heart, and alſo to the courſe of the nervous fluid, from the *cerebellum* or leſſer brain, through the nervous *tubuli*, which go from it to the ſeveral vital organs.

§ 1452. For the circulation of the *lymph*, and of the *nervous fluid*, as to *quickneſs* and *ſlowneſs*, as to *vigour* and *weakneſs*, correſpond with the circulation of the blood.

§ 1453. This moſt evidently appears to be fact, if we conſider not only the *lowneſs* of the ſpirits, and univerſal *faintneſs*, and feebleneſs of the body, which always is very manifeſt while the ſymptoms we are diſcourſing on ſubſiſts; but likewiſe, that ſuch a *feebleneſs* and univerſal weakneſs come on, whenever the pulſe ſinks much below the ſtandard of health.

§ 1454. There is a perpetual *correſpondence* between the THREE general FLUIDS of the body, as to the ſtate of their motions and circulation.

§ 1455. And, therefore, if we direct our conduct for the recovery of our patients rightly, according to the ſtate of the circulation of the blood, we may be ſure we do it properly, as to the courſe of the *lymph* and *nervous* fluid.

§ 1456. But let us inquire how it comes to paſs, or what are the productive cauſes of the quick motions (or agitations) of the muſcles in *tremblings*, *ſhiverings*, and *ſhakings*.

§ 1457. I apprehend, that when the cauſes of a fever ſubſiſt in the blood, and produce thoſe alterations of its natural conſiſtence which terminate in a fever (whether their effects be a *ſpiſſitude* or ſome *viſcid* quality in the blood) that the too great *ſpiſſitude*, or *viſcid* quality (when it increaſes to a certain *degree)* renders the blood's paſſing out of the capillary arteries into the veins difficult and ſlow; and that hereupon a reſiſtance is occaſioned, not only to the courſe of the blood from the heart, but to the courſe of the nervous fluid from *both* the brains.

§ 1458. And as (while life continues, and blood is carried by the *carotid* arteries to both the brains) nervous fluid is continually ſecreting by thoſe two very large and moſt important glands, ſo every quantity of *nervous fluid*, ſecreted by the brains, propels the preceding quantity onwards to all the muſcles where they terminate; and

§ 1459. As in the time of health there is a continual flow of nervous fluid to and through all the muſcles of the body, ſo when the motion of the blood becomes difficult and ſlow through the capillary *ſanguine arteries*, even in every muſcle, it muſt diſtend thoſe arteries, and interrupt the influx of nervous fluid into many of the muſcles; which interruption occaſions a RELAXATION of ſome muſcles; and the relaxation of the muſcles relaxed forces their antagoniſt muſcles into a proportional degree of contraction.

§ 1460. And the contraction of the muſcles contracted forces their antagoniſt muſcles into a proportional degree of relaxation.

§ 1461. Thus I think happen the reciprocal action and re-action, or the quick alternate motions of the muſcles, while, by the diſtended arteries in the muſcles, the influx of the nervous fluid into the muſcles is interrupted or obſtructed, and the *equability* of its courſe deſtroyed; that is, while the circulation of the blood remains ſo obſtructed.

§ 1462. For when the *obſtruction* to the blood's motion is removed, and the pulſe becomes quicker and ſtronger, then the *tremblings*, the *ſhiverings*, or *ſhakings* ceaſe, and the vital heat returns.

§ 1463. We may, by the conſideration of what has been ſaid, know, that the *curative* indication for removing the morbid motions of the muſcles, is to *alter* the ſtate of the blood; and to this end, we ſhould preſcribe ſuch *alterative* medicines as may abate the *ſpiſſid* or *viſcid* quality of it, and recover it to that tenuity which is neceſſary to its paſſing eaſily through the minuteſt ſanguine arteries.

§ 1464. When theſe ſymptoms (§ 1447, 1462.) happen in the beginning of a fever, which is the caſe I am now conſidering, it may anſwer the *curative* indication, if we direct ſome attenuating diluent, in the following manner, viz.

℞ *Sal. nitri (vel ſal. prunell.)* ʒi. *vel* ʒii. *aq. alexiter ſimpl. (vel aq. menth. vulg. ſimpl. vel pſeudo-theæ cum menthâ ppta. vel decoct. hordei)* ℔i. *ſacchar. alb. q. ſ. ad ſaporem gratiſſimum m. f. julepum, cujus tepidè capiat cochl.* ii. *ſingulis horæ quadrantibus, durante ſymptomate*; *vel,*

℞ *Aq. alexiter. ſimpl.*
Aq. menth. vulg. ſimpl. āā ℔ſs.
Sal. prunell. ʒi. *vel* ʒii.

Sp. nitr. dulc. gut. 40.

Sacchar. alb. q. ſ. ad ſaporem gratum m. f. julepum, cujus capiat cochl. ii. *modo jam ſupra præſcript.*

§ 1465. But it ſcarce ever happens that a phyſician has opportunity of viſiting a patient, while theſe ſymptoms ſubſiſt in the beginning of a fever.

§ 1466. Theſe ſymptoms ſometimes happen after a fever has made a ſad progreſs.

§ 1467. In this caſe, the quick, morbid motions of the muſcles, which we call *tremblings*, *ſhiverings* or *ſhakings*, are produced (as I apprehend) by very *different* cauſes, viz. by *deficient* influxes of fluid into many of the muſcles, which do occaſion relaxations of them, and the relaxations of them produce proportional contractions of the others; and in this manner come on thoſe quick motions of the muſcles we have been ſpeaking of.

§ 1468. I am confirmed in this opinion, by conſidering that the quantity of the animal fluids is continually *decreaſing*, while a fever is ſubſiſting; and conſequently, that there is continually an increaſing *deficiency* in the quantity of the blood and nervous fluid, during the continuance of it: and it has further eſtabliſhed me in theſe ſentiments, when I have obſerved, what *ſpeedy* relief my patients under this ſymptom have found, from proper cordial medicines, and a *cordial*, nutritious diet.

§ 1469. When this ſymptom happens in the progreſs of a fever, we ſhould not only preſcribe ſuch *alterative* medicines as may remove the morbid quality which produced it, and brought on the deficiency in the quantity of the animal fluids; but farther direct ſuch RESTORATIVES and ſuch a DIET, as may help to ſupply what is wanting in the blood and nervous fluid.

§ 1470. I muſt add, that the ſymptom under conſideration ſometimes occurs in patients under *chronical* diſtempers, particularly in ſome kind of *palſies*, and in *hyſterical*, and *hypochondriachal* perſons.

§ 1471. In *paralytic* patients, it often reſults from *deficient* influxes of fluid into the muſcles, and then the *curative* indication is, to endeavour the relief of the patient by *cordial* medicines, adapted not only to this, but alſo to his other ſymptoms.

§ 1472. In *hyſterical* and *hypochondriacal* patients it often proceeds from too copious influxes of fluid into ſome muſcles; which as they occaſion thoſe muſcles to contract, ſo they occaſion their antagoniſt muſcles to relax, and thus bring on the *quick*, morbid motions of the muſcles.

§ 1473. In ſuch caſes as theſe, ſome *evacuants* are needful, to reduce the quantity of the animal fluids to the ſtandard of health.

§ 1474. But to know certainly whether the *tremblings*, or *ſhiverings*, or *ſhakings*, proceed from too copious influxes of fluid into the muſcles, we muſt carefully *examine* the patient; and if we find he has the *ſigns* of an exceſs in the quantity of his blood, and nervous fluid, we ought to conclude the morbid motions of the muſcles reſult from the cauſe now ſuppoſed, viz. too great a quantity of the animal fluids.

§ 1475. But if, inſtead of ſuch ſigns, we meet with the ſigns of a *deficiency* in the quantity of the animal fluids, we muſt then infer, that the morbid ſymptoms are brought on by a *deficiency* in the quantity of the blood and nervous fluid;

And muſt chooſe our remedies out of the claſs of *reſtorative* medicines, and direct *nutritious* aliments.

§ 1476. III. The SUBSULTUS TENDINUM. The *leapings* or *ſtartings* of the *tendons* are ſudden, involuntary, and violent *relaxations* and *contractions* of them, which happen in ſome fevers.

§ 1477. Theſe *convulſive* motions ſeldom happen before the diſtemper has made a ſad progreſs, and much exhauſted the body of its fluids; and therefore muſt reſult from *deficient* influxes of fluid into the veſſels of the muſcles *relaxed*, and are the effects of a *deficiency* in the quantity of the *blood* and of the *nervous* fluid.

§ 1478. Theſe motions of the tendons, therefore, are a threatening ſymptom; for as they diſcover a deficiency in the quantity of the animal fluids, ſo they ſhew that the vital ſtrength will hardly be able to continue the action of the vital organs, till the *morbid* quality, on which the fever depends, be removed.

§ 1479. The conſideration of theſe things (§ 1478.) may convince us, that beſide *alterative* medicines, for removing the cauſe which produced the diſeaſe, we ought to direct ſuch a *nutritious* diet, and *cordial* medicines likewiſe, as are always neceſſary, when the quantity of the animal fluids is greatly diminiſhed, and the vital ſtrength is much abated.

§ 1480. I may add, that (in regard to this ſymptom attended with a *weak* pulſe) the application of *bliſtering plaiſters* may be very ſerviceable; as, by their *ſtimulus*, they help to maintain the *contractile* quality of the muſcular fibres and animal veſſels; and ſo to prevent or poſtpone that general *relaxation* of the ſolids, which commonly precedes and introduces death; and as they tend to raiſe the pulſe, and increaſe the force of the action, or in other words, of the *contractions* of the heart and arteries; and likewiſe as they may promote the *attenuation* of the blood, and render thoſe particles of it, which are conſtituent parts of the *nervous* fluid, more eaſily ſeparable from it, and more eaſy to be ſecreted by both the brains.

END of LECTURE XI.

LECTURE XII.

On nervous ſymptoms: and on various ſorts of remedies.

§ 1481. IV. ANother nervous ſymptom which often happens is CONVULSIONS.

I mean by CONVULSIONS, thoſe *involuntary contractions* of the muſcles convulſed, which continue ſome time. Theſe happen to infants and children, and to adult perſons in the progreſs of *acute* diſeaſes; and likewiſe to bodies of different ages under ſome particular *chronical* diſtempers.

§ 1482. And in theſe different caſes the ſymptom (§ 1481.) is produced by very different cauſes; which render different remedies and methods of cure neceſſary.

§ 1483. CONVULSIONS in INFANTS and *children* are moſt frequently produced by two concurrent cauſes, viz. *exceſs* in the quantity of their fluids, and an *acrimony* in the contents of the *ſtomach* and *bowels* (for the moſt part of the *acid* kind); and therefore two ſorts of remedies are generally neceſſary for the cure of them, viz. 1. Such *alterative* medicines as may remove the morbid quality; and 2. Such *evacuants* as may leſſen the quantity of that fluid, which is exceſſive.

§ 1484. But then we muſt carefully inquire into the SIGNS, by which we may be ſure what ſort of *morbid quality* ſubſiſts in the contents of the ſtomach and bowels, and likewiſe in the blood; that we may be able to preſcribe thoſe *alteratives*, which are adapted to the particular caſe of the patient.

§ 1485. We muſt likewiſe endeavour to find out by the SIGNS, which of the *three* general ſorts of fluids is exceſſive; that ſo we may know what ſort of *evacuation* to direct; whether by *bleeding*, or by *purging*, &c. or both.

§ 1486. Or, if we find by the concomitant ſymptoms, that there is an exceſs in each of the three general fluids, it will lead us to conſider in what order and manner to make the evacuations.

§ 1487. The CONVULSIONS which happen in *acute* diſeaſes, after perſons have been languiſhing under them ſeveral days, are brought on by a *deficiency* in the quantity of the animal fluids; and the curative indications, and the ſuitable diet, and medicines, are the ſame as in the caſe of a *ſubſultus tendinum*, § 1476, &c.

§ 1488. There are ſome diſtempers whoſe eſſential SYMPTOMS are CONVULSIONS: particularly the EPILEPSY, and the CATALEPSY.

§ 1489. In the EPILEPSY there happens a ſudden convulſion of the whole body, which makes the perſon ſeized with it (if ſtanding) to *fall*, and is attended with an *abolition*, or *ſuſpenſion* for a time, of all the ſenſes, and of all voluntary motions, and of all the ſenſible functions of the mind.

But the actions of the heart, arteries, and lungs, are ſtill performed; ſo that by the pulſe, and by the reſpiration, we know that the patient is *not* dead.

§ 1490. In the CATALEPSY the *convulſive cauſe* fixes all the parts of the body in the *ſame ſtate* and poſtures in which they were when it occurs; ſo that the head and every limb remains unmoveable, till the cauſe is removed.

§ 1491. And there is commonly in this, no leſs than in the *epilepſy*, an abolition or ſuſpenſion of all the ſenſes, and of all voluntary motions; and likewiſe a ſuſpenſion of all the functions of the mind.

§ 1492. But the vital functions are ſtill performed. The actions of the heart, and arteries, and lungs, are ſtill continued.

§ 1493. The conſideration of theſe things may lead us to apprehend, 1. That the two convulſive diſtempers mentioned (§ 1488.) do not proceed from any thing amiſs in the *cerebellum* or *leſſer brain*, nor in the nerves which go from it, nor from any thing morbid in the vital organs, from nothing amiſs in the heart, arteries, or lungs; and 2. That the primary ſeat of ſuch convulſive diſtempers is in the *common ſenſory*, ſituated in the *greater brain:* that there happens ſome *ſudden obſtruction* in the *cerebrum*, which prevents the images or ideas of external objects from being tranſmitted thither by the nerves from the organs of ſenſe; and which prevents the nerves from being impreſſed or acted upon by the determinations of the will.

§ 1494. Hence reſults in the patient the *incapacity* both of perceiving external ſenſible objects, and of performing voluntary motions.

§ 1495. What may occaſion ſuch an obſtruction in the *ſenſorium commune* I may inquire into hereafter:

§ 1496. And ſhall only further obſerve, that whenever we ſhall be called to any patient, where *convulſions* are either *primary* or *ſymptomatical*, it will be of great importance for us *ſo* to examine into the ſtate of the patient, *as* to find out, whether the quantity of his fluids be *exceſſive* or *deficient*; and to find out what is the *morbid quality* that ſubſiſts in his blood:

§ 1497. Becauſe the knowledge of theſe particulars is neceſſary to our forming a right notion of the cauſe of his diſeaſe, and to our rightly deducing the curative indications.

§ 1498. And it deſerves our notice, that there is a *difference* between *convulſions*, viz. that ſome are attended with much pain, as CRAMPS, or STITCHES; and that others are indolent.

§ 1499. Thoſe convulſions muſt needs be *indolent*, which are attended with an *abolition* of all the ſenſes; and the reaſon of it is very obvious: and likewiſe theſe convulſions muſt be without *pain* when the contraction of the muſcle convulſed is not greater than what is affected by *voluntary* motions.

§ 1500. V. Another morbid ſymptom of the nervous ſyſtem is FAINTINGS; which are *languors* of the vital organs, attended with a feeble pulſe and a faint perſpiration, which induces a feebleneſs in all the parts likewiſe which are the ſubjects of voluntary motions.

§ 1501. This ſymptom proceeds either, 1. From ſome obſtruction in the capillary ſanguine arteries, which occaſions a reſiſtance to the motions of the heart; or, 2. From a want of due influxes of the nervous fluid from the *cerebellum* to the heart, whence its motions become languid, and FAINTNESS enſues.

§ 1502. The curative indications, therefore, lead us to preſcribe ſuch alterative medicines as may remove *that quality* from the blood which occaſioned *obſtructions* in the capillary arteries; and ſuch *reſtorative* and *cordial* medicines as may raiſe the pulſe, invigorate the motions of the blood, and ſtrengthen the action of the vital organs.

§ 1503. I may add, that the efficacy of proper *cordials* for removing *faintneſs*, eſpecially when it reſults from a *deficiency* in the quantity of the nervous fluid, is a fact well known; and confirms the truth of that account which I have given you of the cauſes productive of it, § 1501.

§ 1504. Medicines made with *caſtor*, *amber*, *ſaffron*, and other *hyſteric* and *cardiac* ingredients, have proved effectual for the relief of patients under *languors* and *faintneſs*. But how? only as they render the action of the heart and arteries ſtronger, and augment the too feeble motion of the blood through its veſſels. It is indeed by their *ſtimulus* that they prove ſo beneficial.

§ 1505. If it be ſaid that *cold water* drank, or outwardly applied, will frequently recover perſons from faintings:

§ 1506. I anſwer, it is very true: but it does ſo by the *ſtimulation* it produces; the coldneſs of the water, contracting the coats of the veſſels, forces on the current of their contained fluids, and quickens the motion of the blood and of the nervous fluid.

§ 1507. And I will add, that *cold water* is the fitteſt remedy, if this ſymptom happens in *plethoric* bodies; bodies loaded and oppreſſed with too great a quantity of *ſpiſſid* or *viſcid* fluids;

§ 1508. But is *not* ſo proper a remedy, when the patient has ſeveral days been languiſhing under a conſuming diſeaſe, and where there is a *deficiency* in the quantity of the blood and nervous fluid; at leaſt it ſhould not be the only remedy adviſed, &c.

§ 1509. VI. Another nervous ſymptom is HYSTERIC FITS;

§ 1510. Which every now and then happen in *acute* diſeaſes, but are moſt frequent in *chronical* diſtempers.

§ 1511. This ſymptom (§ 1509.) in *acute* diſeaſes, eſpecially in *eruptive* fevers, is very threatening; becauſe the irregular *convulſive motions* of the muſcles, which attend *hyſteric fits*, commonly occaſion a return of morbid humours from the exterior ſuperficies of the body, to which they were excreted, into the blood again; the conſequence of which is, an increaſe of the fever, and a rendering the recovery of the patient more difficult and doubtful.

§ 1512. That we may have right notions of the cauſes of *hyſteric* fits, we ſhould obſerve, that under all hyſterical diſorders, attended with *laughings*, *cryings*, odd *geſtures*, *riſings* in the *throat*, *ſtrivings*, or *ſtrugglings*, &c. there are alternate *involuntary contractions* and *extenſions* of the *muſcles* hyſterically affected, whether theſe ſymptoms happen in *chronical* or acute diſeaſes.

§ 1513. And, conſequently, that all *hyſteric* fits, as other *convulſive* ſymptoms, muſt be occaſioned either by REPLETION or DEPLETION. We ſhould remember this, and it will lead us to inquire, whether the fluids in the body of our patient be *exceſſive* or *deficient* in quantity; and the knowledge hereof, as a light, will guide our ſentiments and our conduct happily for the relief of our patient.

§ 1514. The productive cauſes of this ſymptom (§ 1540.) are theſe following; ſometimes one, and ſometimes another, viz.

§ 1515. 1. *Exceſs* in the quantity of the blood and nervous fluid: and we have reaſon to apprehend that *hyſterical* diſorders proceed from this cauſe, when they happen in a *plethoric* body, that feeds to the full, and lives a ſedentary, inactive life, and has contracted a morbid habit:

§ 1516. For in ſuch caſes the *involuntary* motions of the muſcles *hyſterically affected* muſt proceed from *influxes* of nervous fluid into the muſcles contracted, which naturally occaſions relaxations of their antagoniſts.

§ 1517. And in theſe caſes, proper gentle *evacuations* made *gradatim*, with ſome diminution of the quantity of *aliments*, and the daily uſe of ſome gentle *exerciſe*, appear plainly to be the rational remedies.

§ 1518. And it well deſerves notice, that women, whoſe employments engage them in daily bodily labours, are very ſeldom, or at leaſt in compariſon with others, troubled with nervous complaints.

§ 1519. But, 2. Another productive cauſe of *hyſterical* diſorders is a *deficiency* in the quantity of the blood and *nervous* fluid: and how this brings on hyſteric fits is manifeſt from what has been already ſaid. *Deficient* influxes of fluid into ſome of the muſcles occaſion them to relax; and their relaxation occaſions their antagoniſt muſcles to contract.

§ 1520. This appears to be the caſe, when this ſymptom happens to perſons under *acute* diſeaſes, after they have been under them ſeveral days, and the quantity of their fluids has thereby been much diminiſhed: and it is the caſe in girls, and young women, afflicted with the *chloroſis*, or *cachexia*, &c. and indeed of any women under a *leucophlegmatic* habit of body, as *ſanguification* in theſe ſorts of bodies is not ſufficiently performed.

§ 1521. In acute diſeaſes, for removing theſe ſymptoms, the curative indications and the proper remedies are the ſame as when the *ſubſultus tendinum* happens.

§ 1522. 3. This nervous ſymptom (1509.) may be the effect of an *obſtructed* and *difficult* circulation of the blood. This will be evident by obſerving, that hyſterical diſorders moſt frequently happen to *female* bodies under an *obſtructed* habit; and that when the *morbid* quality of their blood (which produced the obſtructions) is removed, and the circulation of their fluids is become free and eaſy, that then they likewiſe become free from their *hyſterical* diſorders.

§ 1523. The conſideration of theſe things will eaſily ſatisfy us, that in theſe caſes the curative indications are, by proper *alterative* medicines, to remove the morbid quality of the blood, and the obſtructions dependent on it.

§ 1524. VII. The *ſhivering* RESPIRATION is another *nervous* ſymptom deſerving our conſideration.

§ 1525. This ſymptom in *acute* diſeaſes rarely happens till after the *fever* has made a ſad progreſs; and till the quantity of the animal fluids, by the continuance of it, has been greatly diminiſhed, and the viſcid quality of the blood greatly increaſed.

§ 1526. The cauſes productive of it (§ 1524.) (as I apprehend) are a *deficiency* in the quantity of the blood and nervous fluid, and an unequal *viſcidity* of the blood.

§ 1527. And hence an obſtruction to ſufficient and equable influxes and refluxes of the animal fluids to the veſſels of thoſe muſcles which ſubſerve the office of *reſpiration.*

§ 1528. Whence it happens, that the motions of them in reſpiration becomes interrupted and ſhivering.

§ 1529. The later this ſymptom happens in the diſtemper, the more threatening it is; as the patients ſtrength is proportionally leſs, and the time ſhorter for the uſe of remedies.

§ 1530. The curative indications oblige us to endeavour, by proper *alterative* medicines, to attenuate the blood, and free it from its viſcid quality; and alſo by ſuitable *reſtoratives* to recover the quantity of the blood to the ſtandard of health; to ſtrengthen the ſolids, and reſtore the vital force of the action of the heart and arteries.

§ 1531. The reader may ſee this terrible ſymptom exemplified in my Treatiſe on the Small-pox, part 2. § 207. and how it was happily removed.

§ 1532. And there likewiſe may be ſeen an inſtance of it, and how the death of the patient was the event of the diſeaſe, ibid. § 265, &c.

§ 1533. VIII. The COUGH may fitly be conſidered among the *nervous* ſymptoms; as it is a convulſive motion of the muſcles of the *thorax*.

§ 1534. This ſymptom happens both in *acute* and in *chronical* diſtempers. We often meet with it in the *ſmall-pox*, in the *meaſles*, and always in *pleuriſies*, and frequently in other ſorts of fevers; and in *aſthmas*; and in divers *chronical* diſeaſes.

§ 1535. The COUGH is a convulſive motion, principally of thoſe muſcles and other parts by whoſe action reſpiration is performed;

§ 1536. I ſay *principally*, of theſe muſcles, &c. becauſe the action of coughing, eſpecially if it be violent, affects the whole body, and convulſes moſt parts of it, more or leſs.

§ 1537. And it ſhould be obſerved, that by the convulſive motions of the cough, the expirations of the air from the lungs is frequently interrupted, and the expiration again repeated.

§ 1538. The air (by means of the convulſive motions in coughing) is impelled againſt the ſides of the ſeveral branches of the *aſpera arteria*; and often expelled with unuſual force and noiſe: a noiſe, ſometimes *ſhrill*, and ſometimes more *blunt*, or *hoarſe*; and the convulſive motions are frequently continued, till ſome *phlegm* or other humour is violently ejected.

§ 1539. But whatever be the diſeaſe in which the cough happens, the moſt frequent immediate cauſe of it, is either, 1. A CATARRH, or defluxion of lymphatic humours from adjacent glands on the *larynx*; or,

§ 1540. 2. Lymphatic humours, excreted from the blood into the air-veſicles of the lungs, and in them inſpiſſated, and then elevated by the air inſpired, and raiſed into the mouth by the expirations of the air, occaſion a coughing.

§ 1541. The rational method of treating patients under this ſymptom, is to direct thoſe diluting drinks and *alterative* medicines which may attenuate the blood, render the lymphatic fluids duly thin, and the humours excreted into the cavities of the air-veſicles eaſy to be raiſed by the air in the expirations of the lungs, and ſo expectorated; and ſuch medicines as may increaſe the evacuations by *urine*, and by the *inſenſible* perſpiration, are proper remedies.

§ 1542. But thoſe medicines which tend to ſtop the *cough* are neither proper nor ſafe.

§ 1543. I may obſerve, that thoſe *coughs* which are *ſymptomatical*, and brought on by any kind of fever, or other primary diſeaſe, uſually ceaſe as ſoon as the morbid quality, which produced the *primary* diſeaſe, is altered, and thoroughly removed.

§ 1544. It may be added, that ſome phyſicians diſtinguiſh COUGHS into two ſorts; calling one the *tuſſis humida*, and the other *tuſſis ſicca*.

§ 1545. In the firſt ſort, there is a greater ſecretion of lymph, by the lymphatic glands, than in a time of health; and generally a *catarrh*, with an expectoration of ſome humour, attends it:

§ 1546. But in the other, little or nothing is expectorated; and indeed many *coughs* in their beginning are *dry*; and afterwards become *moiſt*.

§ 1547. But there is a cough which is always *dry*; when perſons have a ſhort, hecking cough, without any *catarrh*, or *defluxion* on the *larynx*.

§ 1548. This moſt frequently happens to *hypochondriacal* men and *hyſterical* women, under a ſcorbutic habit of body;

§ 1549. And is occaſioned, as I apprehend, by *ſaline* particles, tranſmitted to the *larynx*, with but little lymph from the adjacent glands.

§ 1550. The rational method for freeing a patient from this ſymptom, is to direct ſuch *alterative* medicines as may remove or aboliſh thoſe morbid qualities of the blood from which this *cough* proceeds.

§ 1551. But there is a COUGH of another denomination deſerving notice, called *tuſſis convulſiva infantum*; in Engliſh, the WHOOPING COUGH, from the *ſound*, which the *convulſive* motions forcibly extort from children in their fits of coughing.

§ 1552. It ſhould be obſerved, that a fit of *coughing* ſeldom ceaſes, till a vomiting is brought on, and a tumour thereby evacuated; unleſs the child happens to ſwallow it.

§ 1553. The *matter* thrown out by vomiting is generally a *clear*, *viſcous* humour, like a *mucilage*, or *jelly*.

§ 1554. I apprehend that the cauſe of it is, a *diminution* of the *inſenſible* perſpiration.

§ 1555. And that in children, whoſe veſſels are univerſally more lax than in adult bodies, their *lymphatic arteries* are conſequently more lax, and the diameters of them more eaſily enlarged.

§ 1556. And hence a greater flow of lymph, through the lymphatic veſſels into the *air-veſicles* of their lungs, happens, when the inſenſible *perſpiration* is diminiſhed: which humour being carried thither clear (by the exhalation of the thinneſt, moſt limpid parts of it continually with the breath) acquires the conſiſtence of a viſcous MUCILAGE, or *jelly*; which, when it increaſes to a certain a certain quantity, occaſions a cough, which does not ceaſe till it is brought up from the lungs:

And then all is quiet till a freſh quantity is collected.

§ 1557. The reaſon why the fits of coughing return in ſome children more frequently than in others, and in the ſame children more frequently ſome weeks than in others, I take to be this, viz. that the quantity of the *viſcous humour*, neceſſary to occaſion a fit of coughing, is in ſome children ſooner collected than in others; and in the ſame children, in ſome weeks, or in ſome days, it is collected in ſhorter ſpaces of time than in others.

§ 1558. This account of the diſeaſe implies that the *viſcous*, *clear*, jelly-like humour, which children throw out of their mouths in fits of the *hooping-cough*, comes from the lungs, and not from the ſtomach.

§ 1559. And my reaſon for this opinion is, that whatever matter or phlegm happens to be lodged in the ſtomach, if it creates very uneaſy ſenſations, may bring on VOMITINGS; as in ſuch caſes happens among children, without a *cough*, and eſpecially not a fit of coughing, for ſeveral minutes before any vomiting happens.

§ 1560. It is a thing incomprehenſible to me, that any humour in a ſtate of reſt in the ſtomach, and a humour which excites no vomiting, nor ſtomach ſickneſs, or loathing, can *act* as a *ſtimulus* on the *larynx*, and produce an inceſſant coughing for minutes before a vomiting is excited.

§ 1561. But it ſeems eaſy to apprehend, that an *acrimonious*, viſcous humour, extravaſated into the *air-veſicles* in the lungs, may (when the quantity of it is increaſed to a certain degree) by the action of the air paſſing to and from it, irritate the nerves terminating under the internal membrane of the *aſpera arteria*, and affect the whole membrane even to the *larynx*; and excite that violent *coughing* which happens in this diſeaſe.

§ 1562. This *coughing*, as it occaſions the lungs more violently to contract and expand themſelves, muſt unavoidably agitate and move the *viſcous, jelly-like* humour lodged in the *air-veſicles* upwards, till it comes into the mouth, whence it is with violence thrown out of the body.

§ 1563. The conſideration of theſe things, with obſerving the habit of body which thoſe children are under to whom this cough happens, viz. to weakly children, of an obſtructed habit, will lead us to theſe following obſervations, viz.

§ 1564. Obſ. 1. That an *air too cold*, or *too moiſt*, leſſens the quantity that ſhould have perſpired from their bodies, and brings on a morbid quality of their blood, occaſioning obſtructions in ſome of the perſpiratory veſſels, and ſo a deficiency in the ſtrength of the action of their vital organs.

§ 1565. Obſ. 2. That therefore, for the curing children of this diſeaſe, they ſhould be kept within doors, and in ſuch a temperate warmth, as may conduce to the opening the perſpiratory pores, and promoting the inſenſible perſpiration.

§ 1566. Obſ. 3. That thoſe medicines which may remove the morbid quality of the blood, and the obſtructions reſulting from it, and which may ſtrengthen the action of their vital organs, are the proper remedies.

§ 1567. And I ſhall acquaint you with ſuch remedie as, in my experience, have been effectual for curing the *hooping-cough*, when I come to treat on the diſeaſes of children.

§ 1568. IX. The HICCOUGH is another nervous ſymptom, and is a *convulſion* ſometimes primarily of the ſtomach, then of the diaphragm, and of all the muſcles of the body more immediately connected with them.

§ 1569. The HICCOUGH ſometimes happens when perſons are at their meals, and is commonly occaſioned by the eating ſolid food without drinking a ſufficient quantity of liquor. This ſort of *hiccough* is cured by common diluents; and needs not the conſideration or advice of a *phyſician.*

§ 1570. But the HICCOUGH which occurs in *acute* diſeaſes (or when a fever has made a ſad progreſs) I apprehend is brought on by an inflammation of the *diaphragm*, and deficient influxes of blood, and nervous fluid, into the arteries and nerves of it.

§ 1571. And on this account it is one of the mortal ſigns, ſignifying that death is near approaching.

§ 1572. Theſe *convulſive* motions reſult from *depletion*; the quantity of all the animal fluids having been greatly diminiſhed by the continuance of the fever.

§ 1573. The curative indications and proper remedies are the ſame as in the caſe of the *ſubſultus tendinum*, &c.

§ 1574. From the preceding lectures it plainly appears, that there is *a great variety* of *morbid ſymptoms* attending the *various diſeaſes* incident to human bodies, and different COMBINATIONS of theſe ſymptoms. We muſt, therefore, be very careful in examining our patient, that we may have a full knowledge of the ſeveral ſymptoms of the diſeaſe; from whence we may form a notion of the caſe—deduce the cauſe which produced it,—and learn what ſort of medicines are neceſſary for the cure of it.

§ 1575. The FOURTH thing propoſed in the courſe of theſe lectures was, to treat of *medical*

INSTRUMENTS, or of the *various ſorts of remedie*… proper for the cure of diſeaſes.

§ 1576. Proper reflections on the ſeveral cauſes of diſeaſes, and their effects, &c. that is, the ſymptoms occurring to our notice, may convince us, that every man who intends to employ himſelf in the practice of phyſic, may expect occaſion for many, for different purpoſes, or to purſue very different intentions.

§ 1577. And therefore it is neceſſary for us who practiſe phyſic, not only to know the nature of the patient's ſickneſs, and the end we ſhould aim at in order to remove it; but alſo be acquainted with thoſe inſtruments and medicines which are needful, and may be effectual for our purpoſe.

§ 1578. And till a man has the knowledge of theſe things he is not fit for the practice of phyſic: no, no more than a man is fit to undertake, or is capable, rightly to perform a piece of any work, who is not furniſhed with the neceſſary tools for the doing it.

§ 1579. We ſhould conſider the ſeveral things a phyſician will have occaſion to do in the courſe of practice;

§ 1580. And then the INSTRUMENTS, which may be uſeful to him for the doing them.

§ 1581. The particulars I ſhall deduce from the cauſes productive of diſeaſes; and as thoſe cauſes were diſtributed into three general claſſes, ſo I ſhall in the ſame manner diſtribute the particulars which a phyſician ſhould do in the courſe of his *practice*, for curing the many ſorts of diſeaſes he may meet with, viz.

§ 1582. I. He muſt, by proper evacuations, endeavour to take away the *exceſs* of the fluids in diſtempers produced by *exceſs*; and therefore he ſhould be acquainted with all thoſe inſtruments or means, which may be uſeful for diminiſhing the quantity of the ſeveral ſorts of fluids in the body: more diſtinctly,

§ 1583. 1. He muſt in diſtempers produced by, and depending on, too much blood, order blood to be taken from the patient: but that he may rightly determine the quantity of blood to be taken away, and be able to direct the *inſtrument* by which bleeding the patient ſhould be performed, and in what caſes this *evacuation* ſhould not be made, it is requiſite that he underſtand the natural *beneficial* effects of taking blood from perſons *plethoric*; and the natural *prejudicial* effects of bleeding perſons who have not too much blood; and more eſpecially the ſad effects of taking blood from thoſe who have too little of it.

§ 1584. It is likewiſe requiſite that he be acquainted with thoſe *rules* relating to this evacuation, which ought to be obſerved by all who practiſe phyſic.

§ 1585. It is alſo needful, that the phyſician knows the *different effects* of the *different ways* of taking blood from the ſick.

§ 1586. Theſe things, therefore, I propoſe to take notice of, when I come to ſpeak of the inſtruments for letting out blood.

§ 1587. 2. The phyſician (when the diſeaſe is produced by and depends on an *exceſs* in the quantity of the *ſerous* and *lymphatic* humours) muſt make evacuation either by *vomiting*, by *purging*, or by *urine*, or by *ſweating*.

§ 1588. One or other of theſe evacuations he ſhould make, for the relief of his patients; or ſometimes one, and ſometimes another of them, for the curing any diſeaſe of this kind.

§ 1589. It is therefore of great importance for him to underſtand the natural *effects* of theſe ſeveral evacuations, and the *rules* which ſhould be obſerved in the uſe of them.

§ 1590. It is likewiſe neceſſary that he be acquainted with a proper and ſufficient ſortment of *emetic*, *cathartic*, *diuretic*, and *ſudorific* medicines.

Theſe things I ſhall conſider in their proper place.

§ 1591. 3. When the diſeaſe reſults from an exceſs in the quantity of the *nervous* fluid, the phyſicians ſhould endeavour to *diminiſh* the exceeding quantity, and reduce it to the ſtandard of health.

§ 1592. It is therefore needful for him to underſtand, by what method and medicines this end may be accompliſhed. Theſe things I ſhall lay before my reader.

§ 1593. Thus I have ſhewed what things a phyſician has to do for curing diſeaſes produced by, and depending on, ſome *exceſs* in the quantity of the animal fluids.

§ 1594. II. A phyſician, for curing diſtempers produced by and depending on ſome *morbid quality* of the blood, muſt chooſe his remedies out of ſome claſs of the *alterative* medicines. This, in general, is what he ſhould do.

§ 1595. Let it be obſerved, that by *alterative* medicines I mean all thoſe which have a tendency to produce ſome change in the blood, and to alter the morbid quality ſubſiſting in it.

§ 1596. Every medicine, or ſubſtance, may be ſaid to have an *alterative* quality, that has a quality contrary to and capable of altering the quality of another ſubſtance.

§ 1597. Thus, for inſtance, *ſalt of wormwood* has an *alterative* quality, in reſpect to the quality of the *juice of lemons*; becauſe a ſufficient quantity of it, put into the juice of lemons, will alter, change, and utterly deſtroy the *acid* quality of that juice. And, *vice verſa*, the *juice of lemons* has an *alterative* quality, in reſpect to the *ſalt of wormwood*; for a ſufficient quantity of it, put to that *ſalt*, will change and utterly deſtroy the *alcaline* quality of it.

§ 1598. Wherever any two ſubſtances of contrary qualities come together, the one is an *alterative* to the other. On which account, diſeaſes produced by a *morbid* quality are to be cured by medicines whoſe qualities are contrary to the particular morbid quality that produced the diſtemper; which might occaſion that ſaying of *Hippocrates*, and a juſtly prevailing notion, *contraria contrariis curantur*.

§ 1599. Thus diſeaſes, depending upon an *alcaline* quality, are to be removed by medicines of an *acid* quality.

§ 1600. As there are various ſorts of *morbid qualities* incidental to the animal fluids in human living bodies, ſo they may be diſtinguiſhed into two *claſſes*, viz. 1ſt, Thoſe which produce *acute* diſeaſes; and 2dly, Thoſe which bring on *chronical* diſtempers.

§ 1601. I. I ſhall begin with the *firſt* claſs, and recite the particulars contained in it; and obſerve what the phyſician ſhould do in reſpect unto them, for the cure of his patients.

1. The firſt *morbid* quality mentioned (§ 263.) as the productive cauſe of *acute* diſeaſes, was a *ſpiſſitude*, or too great thickneſs in the conſiſtence of the blood, without a *viſcidity*; as in *ardent* fevers.

§ 1602. And, therefore, the phyſician ſhould get the knowledge of thoſe *medicines* which have a quality proper to render the blood *thinner*; and he ſhould preſcribe medicines of this character, as the ſuitable remedies.

§ 1603. Medicines of an *attenuating* nature are the *medical inſtruments* to be uſed for removing diſtempers produced by a ſpiſſitude of the blood.

I propoſe to take notice of a ſufficient number of them.

§ 1604. 2. A *viſcid* quality (§ 266.) is another productive cauſe of divers *acute* diſeaſes; e. g. of *inflammatory*, *pleuritic*, and *intermitting* fevers, &c.

§ 1605. And therefore the *phyſician* ſhould be acquainted with and preſcribe medicines whoſe quality is contrary to a *viſcid* ſtate of the animal fluids.

§ 1606. And when I ſhall diſcourſe on the medical inſtruments, I ſhall relate a ſufficient number of theſe, which in *experience* have been found effectual to free the blood from its *viſcid* quality.

§ 1607. 3. I mentioned (§ 278.) an *alcaline*, *diſſolvent* quality in the blood, as another cauſe productive of *acute* diſeaſes; particularly of *putrid*, peſtilential, and other fevers.

§ 1608. And as ſuch fevers can only be cured by ſuitable *alterative* medicines, ſo it is of importance for thoſe who intend to practiſe phyſic, to know what ſort of medicines have ſuch an *alterative* quality, and to chooſe his remedies out of that claſs.

§ 1609. There are medicines which have been effectual to this purpoſe; and I ſhall acquaint my reader with a ſufficient number of them.

§ 1610. 4. I have obſerved (§ 291.) that *ſpecific*, *morbid* qualities muſt be reckoned among the cauſes productive of *acute* diſeaſes; and have called theſe *ſpecific morbid* qualities, becauſe they are introduced into the blood by *ſpecific*, infecting *effluvia* of contagious diſtempers, as in the *ſmall-pox*, &c.

§ 1611. We know not indeed the figure or texture of the infecting particles of any contagious diſtemper; but by conſidering their manifeſt *effects*, we know, in a great meaſure, what morbid qualities they introduce into the blood; ſometimes rendering it *viſcid*, and ſometimes *too thin*, by *diſſolving* its conſiſtence; and we are thereby directed how to chooſe proper *alterative* medicines.

§ 1612. We know by experience (through the *direction* and *bleſſing* of God) methods and medicines which have proved very effectual for recovering perſons from thoſe *acute* diſeaſes which are produced by *ſpecific*, morbid qualities.

§ 1613. Indeed by different medicines the ſame end may be obtained: I propoſe to give an account of ſuch as I have uſed, and in my experience have found effectual.

§ 1614. 5. I have mentioned (§ 299.) *complex*, *morbid* qualities, as being ſometimes the *productive* cauſes of *acute* diſeaſes.

§ 1615. And in ſuch caſes it is incumbent on the *phyſician* to compound his remedies of different ſuitable *alterative* ingredients, &c.

§ 1616. II. The ſecond claſs of *morbid* qualities comprehended thoſe which bring on *chronical* diſtempers: and I took notice of the chief of this ſort (§ 310.) with the ſigns by which it may be known when this or that morbid quality ſubſiſts; particularly,

1. The *acid* acrimony (§ 311.) and,

§ 1617. When we are to preſcribe for a patient under a diſeaſe reſulting from this cauſe, we muſt chooſe for our remedies medicines of that quality which may deſtroy the *acid* one that produced the diſtemper.

§ 1618. And a ſufficient number of ſuch medicines will be mentioned in a proper claſs of *alteratives.*

§ 1619. 2. I mentioned an *alcaline* acrimony, as another productive cauſe of *chronical* diſtempers, § 317.

And therefore it behoves us to know what medicines are proper to aboliſh ſuch a quality, and to preſcribe ſuch *alteratives.*

§ 1620. I ſhall acquaint my reader with ſuch whoſe efficacy, in ſuch caſes, in my experience has proved them to have a proper *alterative* quality.

§ 1621. 3. A *glutinous* quality is another ſort of morbid qualities belonging to this claſs, &c. § 318.

§ 1622. And therefore it is requiſite that we be acquainted with a ſufficient number of medicines of a quality contrary to it, and which may free the blood from it.

And therefore our *materia medica* ſhould have a claſs of medicines of this kind.

§ 1623. 4. The *pinguedinous*, or *oleaginous* quality (§ 323.) will want a claſs of *ſaponaceous* medicines, as proper *alteratives* for removing it.

And ſuch a claſs I propoſe to exhibit among the medical inſtruments.

§ 1624. 5. The *ſcorbutic*, *ſaline* quality (§ 326.) I obſerved, is productive of manifold *chronical* diſeaſes, indeed of all *cutaneous* diſtempers.

§ 1625. It is therefore incumbent on us to know various ſorts of *alterative* medicines, which by experience have been found effectual for the cure of the ſeveral diſeaſes, produced by and depending on a *ſaline* quality of the blood.

Becauſe ſuch *alterative* medicines are the medical inſtruments to be uſed for freeing the patients from ſuch diſtempers.

I propoſe therefore to give a claſs of theſe remedies.

§ 1626. III. The *third* general ſort of cauſes productive of diſeaſes, are *deficiencies* in the body, of one kind or other: deficiencies, either in the quantity of the red *blood*, or in the quantity of the *lymph*, or of the *nervous fluid:* and hence a *deficiency* in the quantity of the fleſh, and weight of the body: and likewiſe a *deficiency* in the firmneſs of the coheſion of the component parts of the muſcular fibres and animal veſſels: and a *deficiency* in the ſtrength or force of the actions of the vital organs, viz. of the heart, arteries, and lungs.

§ 1627. All theſe *deficiencies* do need the aſſiſtance of a ſuitable *diet*, and of medicines which I have called RESTORATIVES: and theſe are the *medical* INSTRUMENTS to be uſed for curing the diſtempers and *morbid* ſymptoms, produced by and depending on *deficiencies* in the human living body.

And with theſe *medical* INSTRUMENTS we ſhould be well acquainted, and well furniſhed.

§ 1628. We may, from what has been ſaid, obſerve, that the *medical* INSTRUMENTS may be reduced into a few claſſes, viz. 1. *Evacuants*, 2. *Alterants*, and 3. *Reſtoratives.*

§ 1629. I. EVACUANTS. Theſe I ſhall ſubdivide, 1. Into thoſe by which the *red* blood may be diminiſhed. 2. Thoſe by which evacuation may be made of the *ſerous* and *lymphatic* fluids; and, 3. Thoſe by which the quantity of the nervous fluid may be leſſened.

§ 1630. II. The ALTERANTS I ſhall ſubdivide 1. Into claſſes of medicines, which may remove the ſeveral *morbid* qualities which produce *acute* diſeaſes. 2. Into claſſes of medicines which may change the *morbid qualities* (that bring on *chronical* diſtempers)

diſtempers) into the natural and healthy qualities of the animal fluids.

§ 1631. III. RESTORATIVES I ſhall diſtribute, 1. Into thoſe which may help to increaſe the quantity of the animal fluids; 2. Into thoſe which may increaſe the coheſion of the component parts of the ſolids; 3. Into thoſe which may increaſe the vital ſtrength.

END OF LECT. XII. AND VOL. I.